

The Employees' Retirement System for the City of Norfolk

**Actuarial Valuation Report
as of June 30, 2019
The Seventy-Sixth
Actuarial Valuation**

**Produced by Cheiron
October 2019**

TABLE OF CONTENTS

<u>Section</u>		<u>Page</u>
Letter of Transmittal	i	
Foreword.....	ii	
Section I Board Summary	1	
Section II Risk Assessment and Disclosure	9	
Section III Assets	20	
Section IV Liabilities	27	
Section V Contributions.....	32	
Section VI Financial Statement Information.....	39	

Appendices

Appendix A Membership Information	43
Appendix B Actuarial Assumptions and Methods	48
Appendix C Summary of Plan Provisions.....	54

October 28, 2019

Board of Trustees
Employees' Retirement System
City of Norfolk
Norfolk, Virginia 23510

***Re: The Employees' Retirement System for the City of Norfolk -
Actuarial Valuation as of June 30, 2019***

Dear Members of the Board:

At your request, we have conducted an annual actuarial valuation of the Employees' Retirement System for the City of Norfolk as of June 30, 2019. The results of the valuation are contained in this report. The purpose of the valuation is discussed in the Foreword.

The actuarial assumptions used in performing this valuation have been recommended by the actuary and adopted by the Board of Trustees based on the actuary's most recent review of the System's experience completed in July 2017. We believe the assumptions used, in aggregate, reflect our best estimate of anticipated future experience of the Plan. The results of this report are only applicable to the contribution for the fiscal year ending June 30, 2021, and rely on future plan experience conforming to the underlying assumptions. Future valuation reports may differ significantly from the current results presented in this report due to such factors as the following: plan experience differing from that anticipated by the assumptions; changes in assumptions; and changes in plan provisions or applicable law.

The purpose of this report is to present the annual actuarial valuation of the Employees' Retirement System for the City of Norfolk. The report also provides information regarding employer contribution levels.

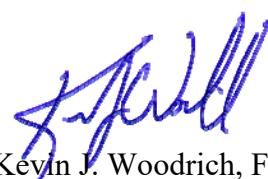
This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys and our firm does not provide any legal services or advice.

This actuarial report was prepared exclusively for the City of Norfolk for the purpose described herein. Other users of this valuation report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any such other users.

Sincerely,
Cheiron

A handwritten signature in blue ink that reads "Fiona E. Liston".

Fiona E. Liston, FSA, EA, MAAA
Principal Consulting Actuary

A handwritten signature in blue ink that reads "Kevin J. Woodrich".

Kevin J. Woodrich, FSA, EA, MAAA
Principal Consulting Actuary

cc: Justin Runkel, ASA, EA

**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

FOREWORD

Cheiron has performed the actuarial valuation of the Employees' Retirement System for the City of Norfolk as of June 30, 2019. The purpose of this report is to:

- 1) **Measure and disclose**, as of the valuation date, the financial condition of the System;
- 2) **Indicate trends** in the financial progress of the System;
- 3) **Determine the contribution rate** to be paid by the City for fiscal year June 30, 2021; and
- 4) **Provide specific information** used in preparing the System's financial statement. All other disclosure information required under Governmental Accounting Standards Board (GASB) Statements No. 67 and 68 will be sent under separate cover.

An actuarial valuation establishes and analyzes the System's assets and liabilities on a consistent basis, and traces the progress of both from one year to the next. It includes measurement of the System's investment performance as well as an analysis of actuarial liability gains and losses.

Section I presents a summary containing our findings and discloses important trends experienced by the System in recent years.

Section II is a new section that assesses and discloses various actuarial risk measures of the Program. While much of this information had been disclosed in previous reports, it was combined in this new section with additional disclosures added to reflect a new Actuarial Standard of Practice (ASOP 51).

Section III contains details on various asset measures, together with pertinent performance measurements.

Section IV shows similar information on System liabilities, measured for actuarial, accounting, and government reporting purposes.

Section V develops the employer contribution rate used to calculate the amount of the contribution to be paid by the City effective July 1, 2020.

Section VI includes certain required disclosures for financial statements.

The appendices to this report contain a summary of the System's membership at the valuation date, the actuarial methods and assumptions used in the valuation and a summary of the major provisions of the System.

In preparing our report, we relied without audit, on information (some oral and some written) supplied by the System's staff. This information includes, but is not limited to, the plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23 Data Quality.

**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

SECTION I – BOARD SUMMARY

General Comments

The City Code states that each year the Board must certify to the City Manager the amount of appropriation required for the ensuing year to meet the normal and accrued liability contributions payable by the City. The results of this valuation determine the contribution rate to be used in calculating the City contribution amount to be paid for the fiscal year beginning July 1, 2020. The contribution rate for General Employees is determined to be 13.93%. The contribution rate for Firefighters and Police is determined to be 31.75%. The composite rate is equal to 20.30% of annual payroll. This is an increase from the composite rate of 19.50% determined in last year's valuation, which is applicable to the current fiscal year. Concurrent with this year's valuation, we have incorporated an explicit assumed administrative expense load of 0.35% in the City's contribution rate. By doing so, the System's assumed 7.00% investment return can be considered as being net of only investment expenses as mandated under GASB.

Forecasts show that should all assumptions be realized, including the 7.00% assumed annual investment return, the System's funded status would increase from 79% to 93% over the next 15 years. Please note that this projection does **not** recognize the City's tendency to offer ad hoc COLAs. If the assumptions were changed to recognize future COLAs upfront, the System's funded ratio would be significantly lower, but the System would no longer experience losses each time a COLA is granted.

Recent Experience

The financial markets performed worse than expected during the fiscal year ending June 30, 2019. The actual return on a market value basis was approximately 5.11%. The System also experienced a loss on the actuarial value of assets. On an actuarial value basis, the assets returned 6.73% compared with an assumed rate of return of 7.00%. The loss recognized for funding purposes was \$6.6 million.

On the liability side, the System's experience resulted in an actuarial gain of \$9.3 million, which represents roughly 0.68% of the prior year's liabilities. This liability gain was due primarily to salaries not increasing as much as assumed.

The combination of these changes produced a slight increase in the System's funding ratio (actuarial value of assets over actuarial liability) from 78.0% as of June 30, 2018 to 78.5% as of June 30, 2019.

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION I – BOARD SUMMARY

Trends

It is important to take a step back from the latest results and view them in the context of the System's recent history. Here we present a series of graphs that display key factors in the valuations over the last ten years.

Growth in Assets

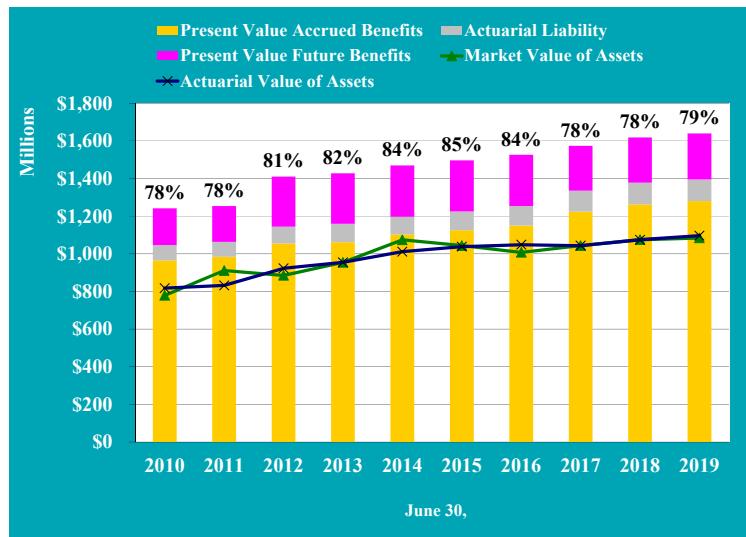


The market value of assets (MVA) experienced a return of 5.11% this year. Due to the asset smoothing method in place, the actuarial value of assets (AVA) increased as a result of recognizing historical gains that have been deferred. As a result, the return on the AVA was 6.73%. The numbers refer to the MVA as illustrated by the green bar.

Assets and Liabilities

The three colored bars represent the three different measures of liability mentioned in this report. For funding purposes, the target amount is represented by the top of the gray bar. We compare the actuarial value of assets to this measure of liability in developing the funded percent. These are the percentages shown in the graph labels.

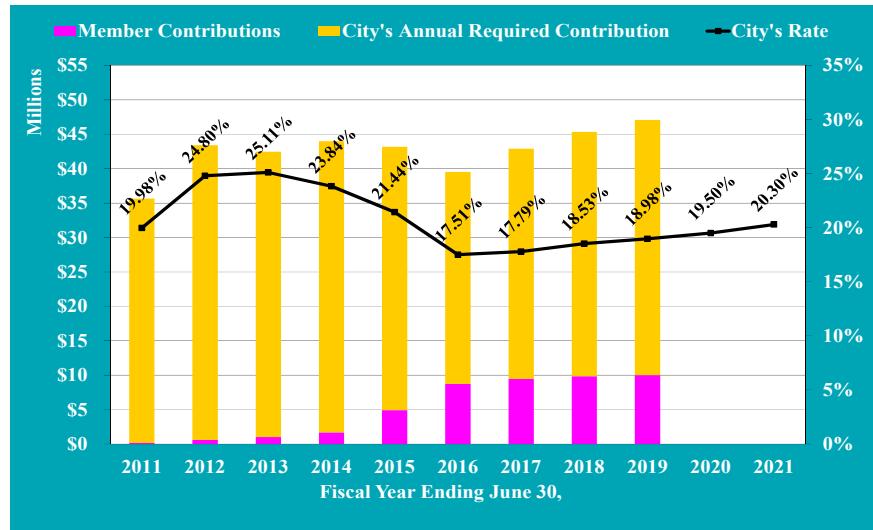
The amount represented by the top of the pink bars, the present value of future benefits, is the amount needed to provide all benefits for the current participants and their beneficiaries. The top of the yellow bars measures the liability attributable to benefits accrued to date.



THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION I – BOARD SUMMARY

Contribution Rates

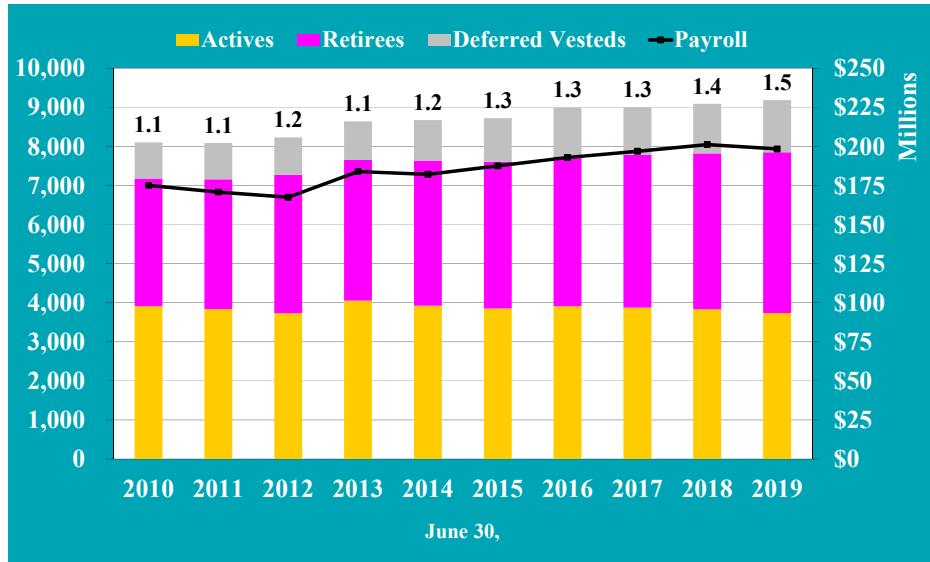


the period July 1, 2019 to June 30, 2020. This amount equaled \$38.5 million and was planned on being paid by the City in July 2019. Effective January 8, 2015, all members are required to contribute 5% of pay, with the exception of City Council members hired before October 5, 2010.

Participant Trends

This graph shows the number of actives, retirees and deferred vested members in the System as of each valuation date. The black line shows historic growth in the total covered payroll of the System (right-hand scale). As with any maturing pension plan, the number of retirees continues to increase over the period whereas the number of actives have remained relatively stable. The numbers above the bars on the graph indicate the ratio of inactive participants to active participants. Over the past ten years, this ratio has increased as the System continues to mature. When higher contributions are required to meet funding shortfalls caused by poor investment performance, the leveraging impact of a higher ratio becomes significant. This is because, though investment shortfalls impact total assets (i.e., actives and inactives), contributions are only made on behalf of the System's active participants.

The yellow bars in this graph show the actual contribution amounts that have been booked by the City. The black line shows this contribution as a percent of payroll (right hand scale). The City contribution rate is set by the actuarial process. Please note there is a lag in the rate. For example, the June 30, 2018 valuation determined the annual required contribution for



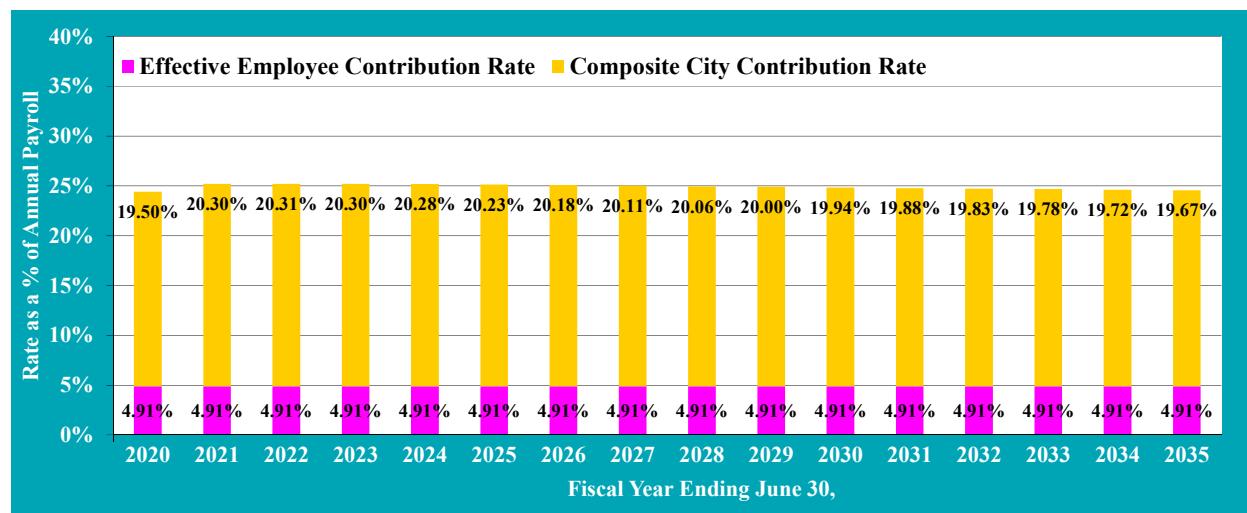
**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

SECTION I – BOARD SUMMARY

Baseline Projections

Our analysis of the projected financial trends for the System is an important part of this valuation. In this section we project future valuation results, focusing on the previously referenced funded ratio (on an Actuarial Value of Asset basis) and the expected City contributions. We present a baseline projection of these metrics based on all actuarial assumptions being exactly met during the projection period, including the assumed 7.00% investment return being achieved each year. In the risk section of the report (Section II), we demonstrate how sensitive future valuation results are to deviations in actual returns from the assumed investment returns by presenting similar results with investment returns deviating from those assumed.

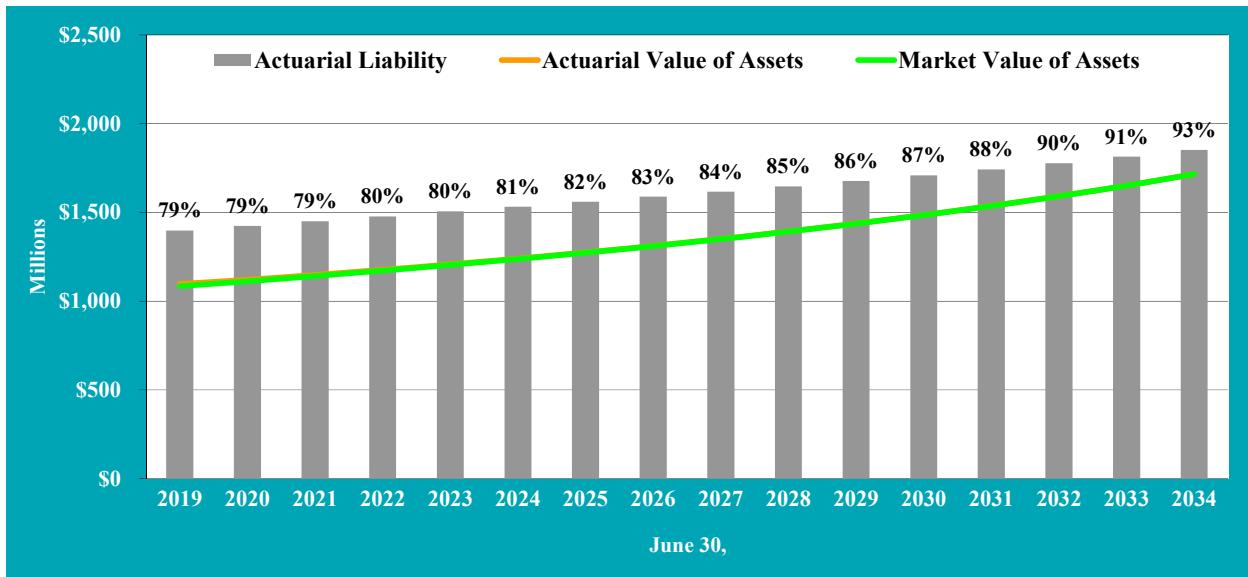
The two graphs below show the expected progress of the Plan over the next 15 years.



The graph above shows that the City's contribution rate is projected to slowly decrease over time as a percentage of payroll if all actuarial assumptions are met, including the 7.0% interest rate. This slight decrease in the City's contribution rate occurs as new participants subject to the higher Normal Retirement Age become participants in the Plan. The higher Normal Retirement Age results in the City having a longer period to fund their benefit and thus the normal cost percentage will be less. The effective employee contribution rate is less than 5% due to both City Council members and those participants who have elected or expected to elect the Deferred Retirement Option Program (DROP), but have yet to receive a monthly payment. However, because the City contributes to the System for these participants, their pay is included.

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION I – BOARD SUMMARY



The graph on the next page shows the projected funding status over the next 15 years. As you can see, the System's funded status is projected to improve to reach 93% by the end of the period shown as contributions pay down the existing unfunded liability. These projections do not include any assumption for future ad hoc COLAs.

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION I – BOARD SUMMARY

Table I-1
Summary of Principal Plan Results
Combined
(\$ in Thousands)

	June 30, 2018	June 30, 2019	% Change
<u>Participant Counts</u>			
Actives	3,836	3,739	(2.5%)
Leave of Absence ¹	25	39	56.0%
Terminated Vested	1,266	1,333	5.3%
Participants Due Account Balance	339	498	46.9%
In Pay Status	3,994	4,119	3.1%
DROP Participants	69	47	(31.9%)
Total	9,529	9,775	2.6%
Annual Salaries of Active Members ²	\$ 201,325	\$ 198,511	(1.4%)
Annual Retirement Allowances ³	88,513	91,549	3.4%
<u>Assets and Liabilities</u>			
Actuarial Liability (AL)	\$ 1,377,889	\$ 1,397,988	1.5%
Assets for Valuation Purposes (AVA)	<u>1,074,892</u>	<u>1,097,451</u>	2.1%
Unfunded Actuarial Liability	\$ 302,997	\$ 300,537	
Funding Ratio (AVA ÷ AL)	78.01%	78.50%	
Funding Ratio (MVA ÷ AL)	78.04%	77.56%	
Present Value of Accrued Benefits	\$ 1,262,585	\$ 1,285,635	1.8%
Market Value of Assets (MVA)	<u>1,075,330</u>	<u>1,084,248</u>	0.8%
Unfunded Accrued Benefit Liability	\$ 187,255	\$ 201,387	
Accrued Benefit Funding Ratio	85.17%	84.34%	
<u>City Contributions as a % of Payroll</u>			
	Fiscal Year 2020	Fiscal Year 2021	
Normal Cost Contribution	8.65%	8.69%	
Unfunded Actuarial Liability Contribution	10.85%	11.26%	
Expense Contribution	<u>N/A</u>	<u>0.35%</u>	
Total Contribution	19.50%	20.30%	

¹ 19 and 23 participants on Leave of Absence as of June 30, 2018 and June 30, 2019, respectively, are entitled to a vested benefit.

² Includes salaries for the DROP participants.

³ Includes the monthly benefit amounts for the DROP participants. For those in the DROP period, the amount shown is 70% of the full monthly benefit.

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION I – BOARD SUMMARY

Table I-2
Summary of Principal Plan Results
General Employees
(\$ in Thousands)

	June 30, 2018	June 30, 2019	% Change
<u>Participant Counts</u>			
Actives	2,689	2,599	(3.3%)
Leave of Absence ¹	14	27	92.9%
Terminated Vested	978	1,032	5.5%
Participants Due Account Balance	288	412	43.1%
In Pay Status	<u>2,732</u>	<u>2,812</u>	2.9%
Total	6,701	6,882	2.7%
Annual Salaries of Active Members	\$ 129,910	\$ 127,569	(1.8%)
Annual Retirement Allowances	47,847	49,898	4.3%
<u>Assets and Liabilities</u>			
Actuarial Liability (AL)	\$ 729,215	\$ 737,771	1.2%
Assets for Valuation Purposes (AVA)	<u>597,998</u>	<u>606,236</u>	1.4%
Unfunded Actuarial Liability	\$ 131,217	\$ 131,535	
Funding Ratio (AVA ÷ AL)	82.01%	82.17%	
Funding Ratio (MVA ÷ AL)	82.04%	81.18%	
Present Value of Accrued Benefits	\$ 671,347	\$ 683,657	1.8%
Market Value of Assets (MVA)	<u>598,241</u>	<u>598,943</u>	0.1%
Unfunded Accrued Benefit Liability	\$ 73,106	\$ 84,714	
Accrued Benefit Funding Ratio	89.11%	87.61%	
<u>City Contributions as a % of Payroll</u>			
Normal Cost Contribution	6.06%	5.91%	
Unfunded Actuarial Liability Contribution	7.27%	7.67%	
Expense Contribution	<u>N/A</u>	0.35%	
Total Contribution	13.33%	13.93%	

¹ 10 and 17 participants on Leave of Absence as of June 30, 2018 and June 30, 2019, respectively, are entitled to a vested benefit.

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION I – BOARD SUMMARY

Table I-3
Summary of Principal Plan Results
Firefighters and Police
(\$ in Thousands)

	June 30, 2018	June 30, 2019	% Change
Participant Counts			
Actives	1,147	1,140	(0.6%)
Leave of Absence ¹	11	12	9.1%
Terminated Vested	288	301	4.5%
Participants Due Account Balance	51	86	68.6%
In Pay Status	1,262	1,307	3.6%
DROP Participants	69	47	(31.9%)
Total	2,828	2,893	2.3%
Annual Salaries of Active Members ²	\$ 71,415	\$ 70,942	(0.7%)
Annual Retirement Allowances ³	40,666	41,651	2.4%
Assets and Liabilities			
Actuarial Liability (AL)	\$ 648,674	\$ 660,217	1.8%
Assets for Valuation Purposes (AVA)	476,894	491,215	3.0%
Unfunded Actuarial Liability	\$ 171,780	\$ 169,002	
Funding Ratio (AVA ÷ AL)	73.52%	74.40%	
Funding Ratio (MVA ÷ AL)	73.55%	73.51%	
Present Value of Accrued Benefits	\$ 591,238	\$ 601,978	1.8%
Market Value of Assets (MVA)	477,089	485,305	1.7%
Unfunded Accrued Benefit Liability	\$ 114,149	\$ 116,673	
Accrued Benefit Funding Ratio	80.69%	80.62%	
City Contributions as a % of Payroll		Fiscal Year 2020	Fiscal Year 2021
Normal Cost Contribution		13.35%	13.68%
Unfunded Actuarial Liability Contribution		17.36%	17.72%
Expense Contribution	N/A	0.35%	
Total Contribution	30.71%	31.75%	

¹ 9 and 6 participants on Leave of Absence as of June 30, 2018 and June 30, 2019, respectively, are entitled to a vested benefit.

² Includes salaries for the DROP participants.

³ Includes the monthly benefit amounts for the DROP participants. For those in the DROP period, the amount shown is 70% of the full monthly benefit.

**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

SECTION II – RISK ASSESSMENT AND DISCLOSURE

Introduction

Actuarial Standard of Practice (ASOP) No. 51 was published by the Actuarial Standards Board to provide guidance to actuaries on the assessment and disclosure of risks related to the possibility that future pension plan experience will deviate from assumptions. This standard does not introduce new concepts to actuarial work; it simply attempts to provide some codification of the practice. Our reports have routinely included stress testing of the valuation results showing the impact of future experience deviating from the underlying assumptions as well as other communications related to the risks that the actual condition of the System will deviate from our valuation results. However, with this ASOP becoming effective for this June 30, 2019 Actuarial Valuation Report, we have taken this as an opportunity to consolidate the information regarding assessment and disclosure of the System's risks in this section as well as add a number of additional items helping to communicate and understand these risks.

The System's actuarial valuation results are dependent on assumptions about future economic and demographic experience. Based on actuarial standards of practice, the assumptions represent a reasonable estimate for future experience. However, actual future experience will never conform exactly to the assumptions and may differ significantly from the assumptions. This deviation is the risk that pension plan sponsors undertake in relying on a pension plan's actuarial valuation results.

This section of this report is intended to identify the primary drivers of these risks, provide background information and assessments about these identified risks, and communicate the significance of these risks to this Program.

Identification of Risks

For this System, the three primary valuation results that can significantly differ from those expected are in the assets, liabilities, and employer contributions. While there are several factors that could lead to these results being different, we believe the primary risks are:

- Investment risk,
- Longevity and other demographic risks,
- Plan change risk, and
- Assumption change risk.

**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

SECTION II – RISK ASSESSMENT AND DISCLOSURE

Other risks that we have not identified may also turn out to be significant.

Investment Risk is the potential for investment returns to deviate from what is expected. When actual investment returns are lower than the investment assumption used in the actuarial valuation (currently assume 7.0% per year), the unfunded liability will increase and will require higher contributions than otherwise anticipated. But, when actual returns exceed the assumption, the resulting unfunded liability measurements and actuarially determined contributions will be lower than anticipated. As seen in the historical section that follows, this has been a significant driver of deviations in the actual measurements for this System from those expected by the valuations.

Longevity and Other Demographic Risk is the potential for mortality or other demographic experience to be different than expected. Generally, longevity and other demographic risks emerge slowly over time as the actual experience deviates from expected. In addition, the extensive number of assumptions related to longevity and demographic experience often result in offsetting factors contributing to the System's overall liability experience. As such, these risks are often dwarfed by other risks, particularly those due to the investment returns. The historical section shows that the System has experienced liability gains in each of the last ten years. However, the amounts of these liability gains are small in many years, especially when compared to investment return experience.

Assumption Change Risk is the potential for the environment to change such that future valuation assumptions are adjusted to be different than the current assumptions. For example, declines in interest rates over time may result in a change in the assumed rates of return used in the valuation. A healthier workforce may result in changes in employee behavior such that retirement rates are adjusted to reflect employees working longer. Assumption change risk is an extension of the risks previously identified, but rather than capturing the risk as it is experienced, it captures the cost of recognizing a change in the environment when the current assumption is no longer reasonable. The historical review section illustrates that assumption change risk has had a measurable impact in 2012 when the Board elected to reduce the assumed investment return from 7.5% to 7.0% and in 2017 when the Board may a multitude of assumption changes as a result of an experience study.

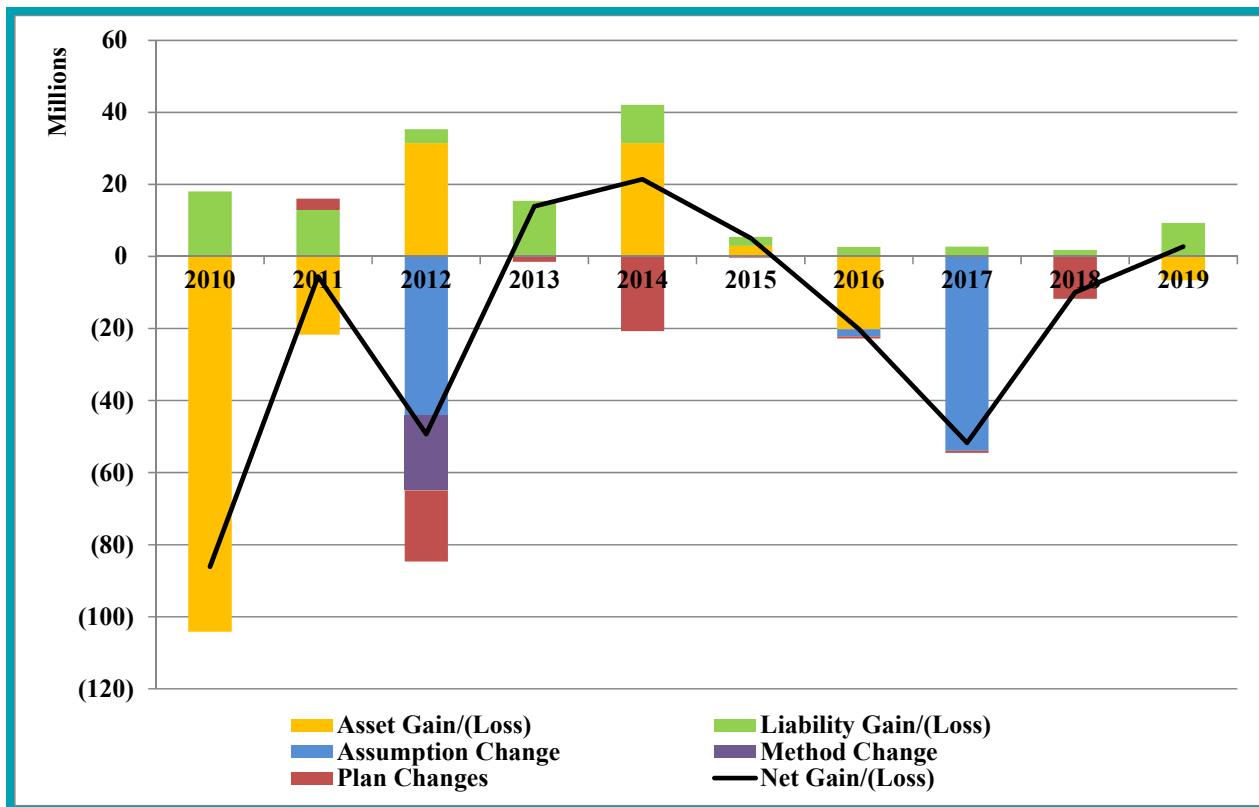
Plan Change Risk is the potential for the provisions of the System to be changed such that the funding or benefits are changed materially. In addition to the actual payments to and from the System being changed, future valuation measurements can also be impacted, with System changes leading to deviations between actual future measurements and those expected by the current valuation. One example of these plan changes is the cost-of-living adjustments awarded to retirees in the past as well as the City's amendment to change the Normal Retirement Age and definition of Final Average Earnings for new employers hired after June 30, 2018. The impact of these plan changes on the City's contribution rate will be slowly realized as more of the active population is impacted by these changes over time. The historical review section will show that plan change risk has resulted in deviations in the actual measurements for this System from those expected by the valuations.

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION II – RISK ASSESSMENT AND DISCLOSURE

Historical Experience Deviations

In understanding the impact of some of these risks, it is useful to look at past experience deviations. These deviations are commonly referred to as actuarial gains and losses. The following graph shows the gains/(losses) at each valuation date between the actual and expected experience broken down by cause.



As described previously and is evident in this graph, assumption changes, asset gains/(losses) and liability gains/(losses) have been the most significant risks for the System.

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION II – RISK ASSESSMENT AND DISCLOSURE

Plan Maturity Measures

As pension plans become more mature, the primary risks of adverse investments, demographic deviations, plan changes, and assumption change experience become of more significant concern. As a result, it has become increasingly important to examine measures that indicate a pension plan's maturity level. With shrinking workforces, aging Baby Boomers, and retirees living longer, plans pay out more in benefits than they receive in contributions – leading to negative cash flows, excluding investment income.

When plans with negative cash flows suffer investment losses, they need to liquidate enough assets to pay for benefits in excess of contributions. That means these plans will need to earn higher returns to rebuild their assets to the previous levels. Plans with negative cash flows exceeding five percent of assets are especially vulnerable to asset losses.

The balance of this section discloses and examines three maturity measures: the asset leverage ratio, the support ratio, and the net cash flow ratio.

Asset Leverage Ratio

One of the more important plan maturity measures is the asset leverage ratio – the market value of assets divided by the plan's payroll. As a plan matures, its assets increase. Once a plan is fully funded, contributions will decrease. The greater the plan's assets are relative to payroll, the more vulnerable the plan is to investment volatility.

As an example, here are two plans that both experience a 10% investment loss equaling \$500 million. Plan A's asset leverage ratio is 10 and Plan B's ratio is 5 – this means that Plan A has to spread or amortize that loss over a payroll that is half as large as Plan B's.

	(\$ in millions)	
	Plan A	Plan B
Plan Assets	\$ 5,000	\$ 5,000
Payroll	\$ 500	\$ 1,000
Asset Leverage Ratio	10.0	5.0

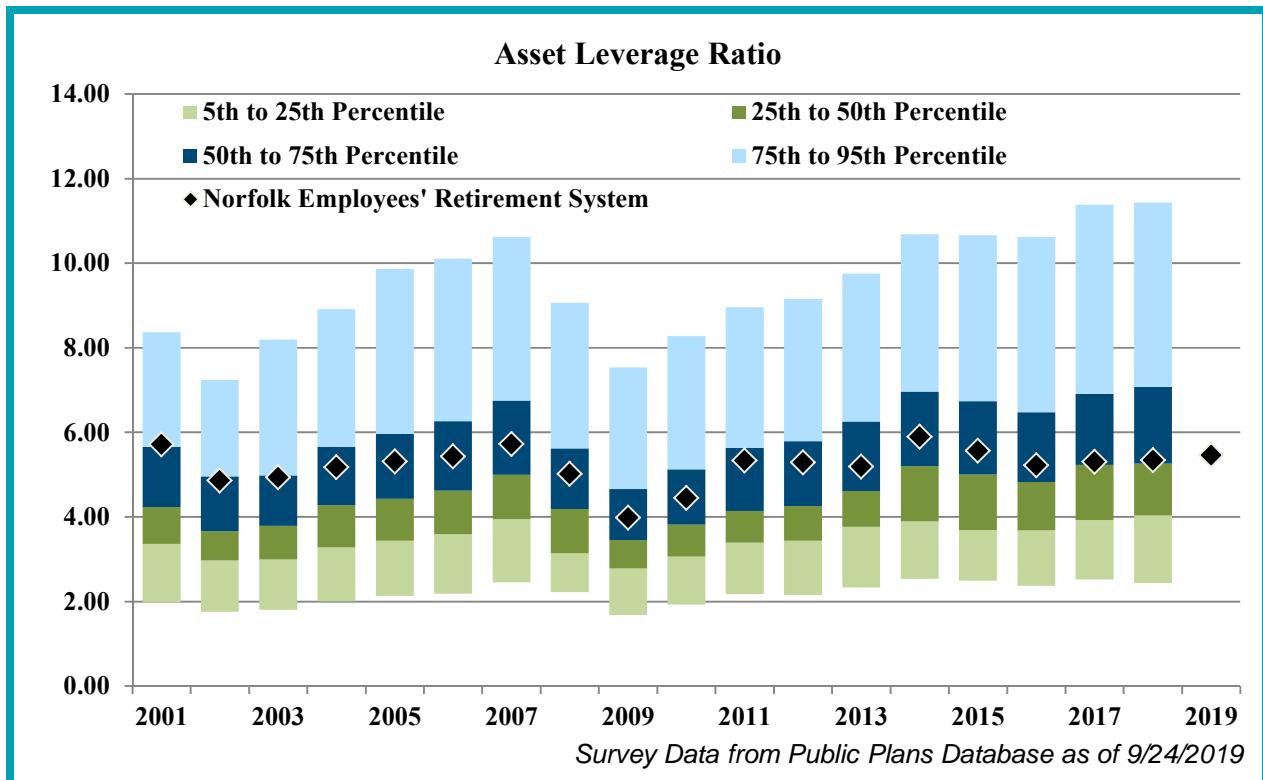
10% investment loss	\$ 500.0	\$ 500.0
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The Boston College's Center for Retirement Research, NASRA and the Center for State and Local Government Excellence maintain the Public Plan Database that contains the majority of state plans as well as many large municipal plans. The chart shows the asset leverage ratios for all plans in this database since 2001. The colored bars represent the central 90% of the asset leverage ratios for the plans. The Employees' Retirement System for the City of Norfolk is represented by the black diamonds. Until recently, the System's asset leverage ratio was above the 50th percentile of all plans and even near the 75th percentile in some of the earliest years

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION II – RISK ASSESSMENT AND DISCLOSURE

shown. The System's asset leverage ratio in recent years has been around 5.5 putting the System closer to the 50th percentile. Since the System has trended to be closer to the median, the System is matured at a slower rate than the database of plans based on this particular metric.



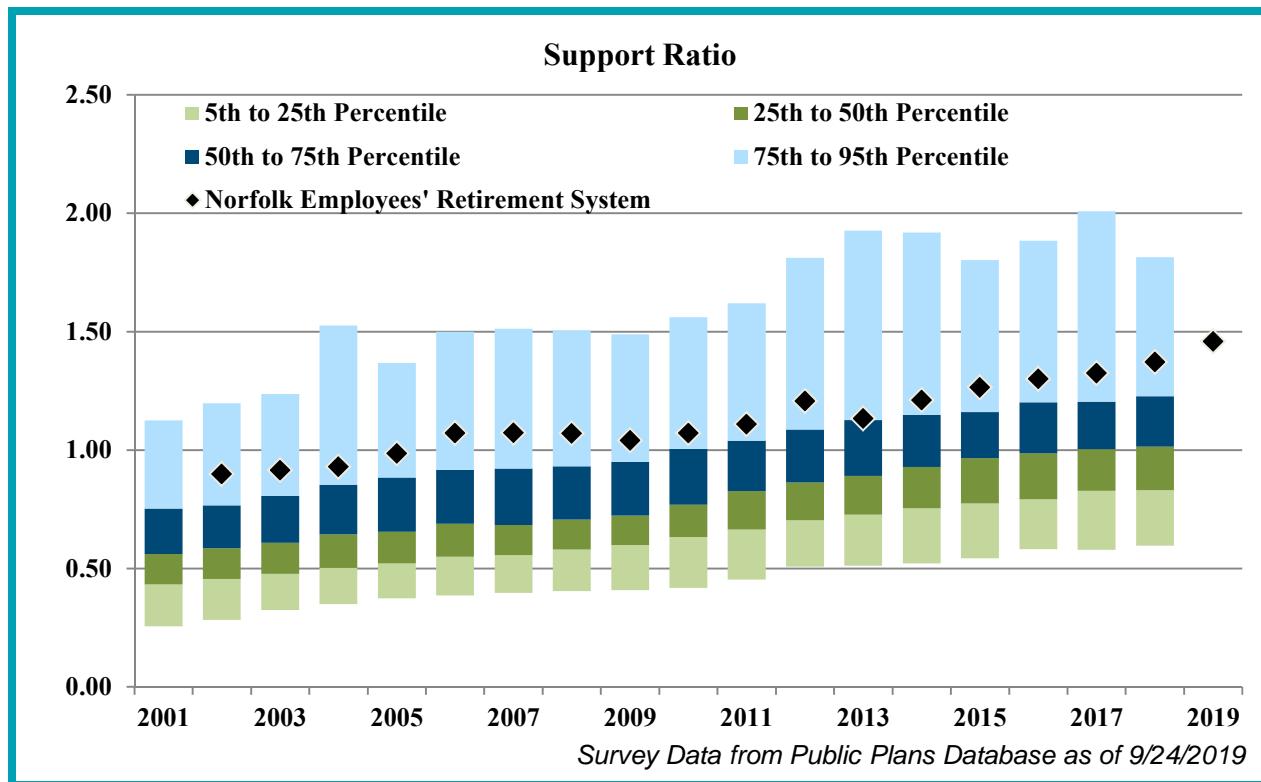
Support Ratios

A commonly used measure of plan maturity is the Support Ratio – the ratio of retired and inactive members or those receiving benefits or entitled to a deferred benefit to the number of active members or those currently accruing benefits in the plan. The greater this ratio, the more likely that the plan will have or develop negative cash flows.

The graph shows the support ratio over time for the System compared to the Public Plan database.

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION II – RISK ASSESSMENT AND DISCLOSURE



The black diamonds in this graph shows that the System's support ratio for each year has generally increased over time and has remained above the 75th percentile level over the entire period. This indicates that the System is maturing, as have most plans in this database over the years, and has done so at a slightly faster rate than the universe of plans.

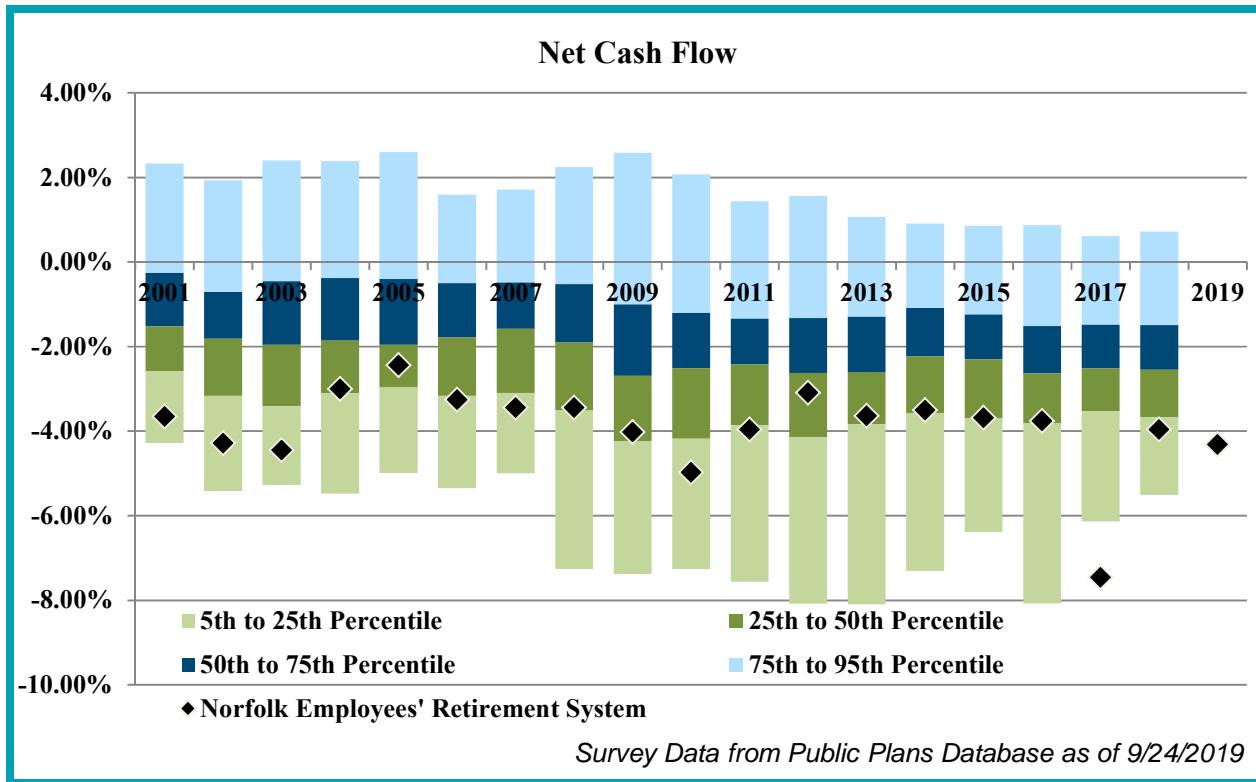
Net Cash Flow Ratio

Another measure of plan maturity is the ratio of the net cash flow out of the plan – benefits and expenses less contributions – divided by the market value of plan assets. When this ratio is significantly negative or greater, a plan is very vulnerable to market declines.

This chart shows that the System's net cash flow ratio has remained relatively stable over the last several years. The large negative percentage in 2017 was a result of the City changing how it reflects contributions in its financials. Relative to the universe, the System has had consistently more negative cash flows than the median plan in the public plan database. This measure thus again provides some indication that this System is more mature than the typical public plan.

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION II – RISK ASSESSMENT AND DISCLOSURE



Assessing Future Risk

Assessing the future risk that the expected measurements produced by the actuarial valuations will deviate from the actual values over time is complex and can never be exactly known.

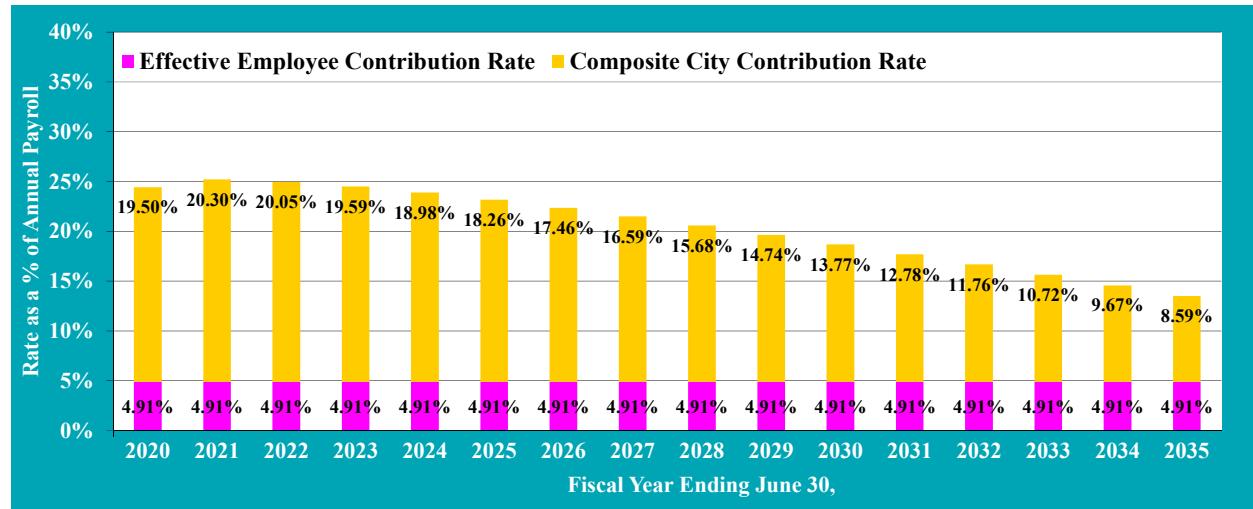
Pages 4 and 5 in the Board Summary have additional detail on the baseline projection. It is important to note that baseline projections, while valid, **are not going to occur** as experience never conforms exactly to assumptions every year. As discussed in the plan maturity section, as plans become more mature some, it becomes more difficult to recover from market declines even when the average investment return over a long period is equal to the expected return. As a demonstration of this, the following projections are included, which is based on assuming varying returns in the future if rates were 9.0% per year (2% more than assumed) or 5.0% per year (2% less than assumed).

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

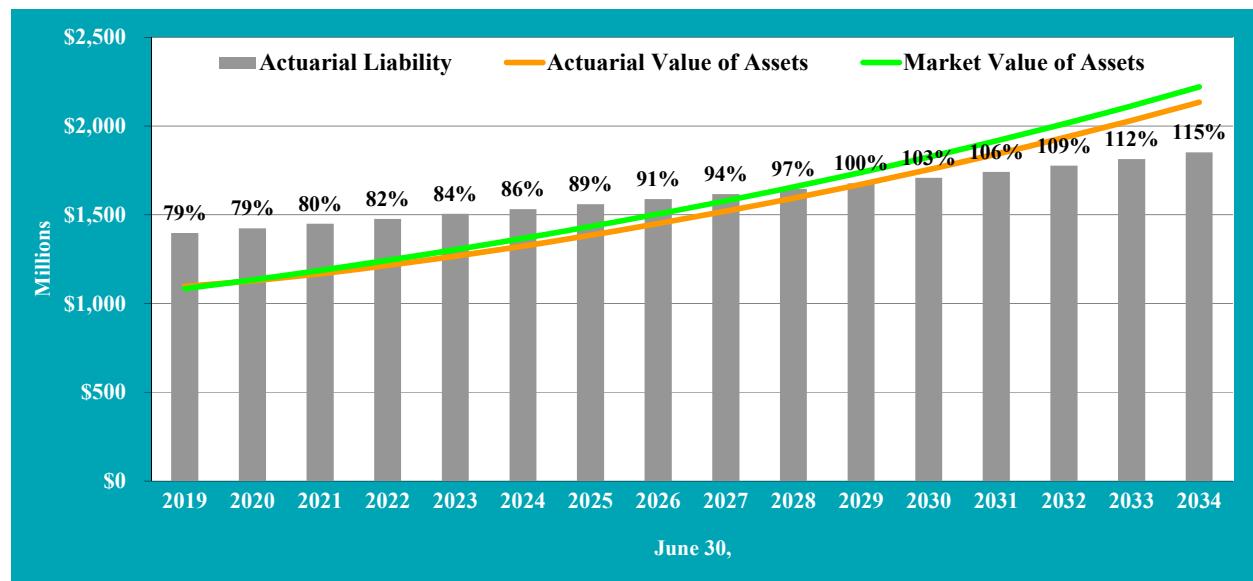
SECTION II – RISK ASSESSMENT AND DISCLOSURE

Projections with Asset Returns of 9.0%

The next two graphs show what the next 15 years would look like with a 9.0% annual return in lieu of the assumed 7.0%.



As you can see, the City's composite contribution rate would drop from its Fiscal Year 2021 level of 20.30% of payroll down to 8.59% of payroll by the end of the 15-year period.



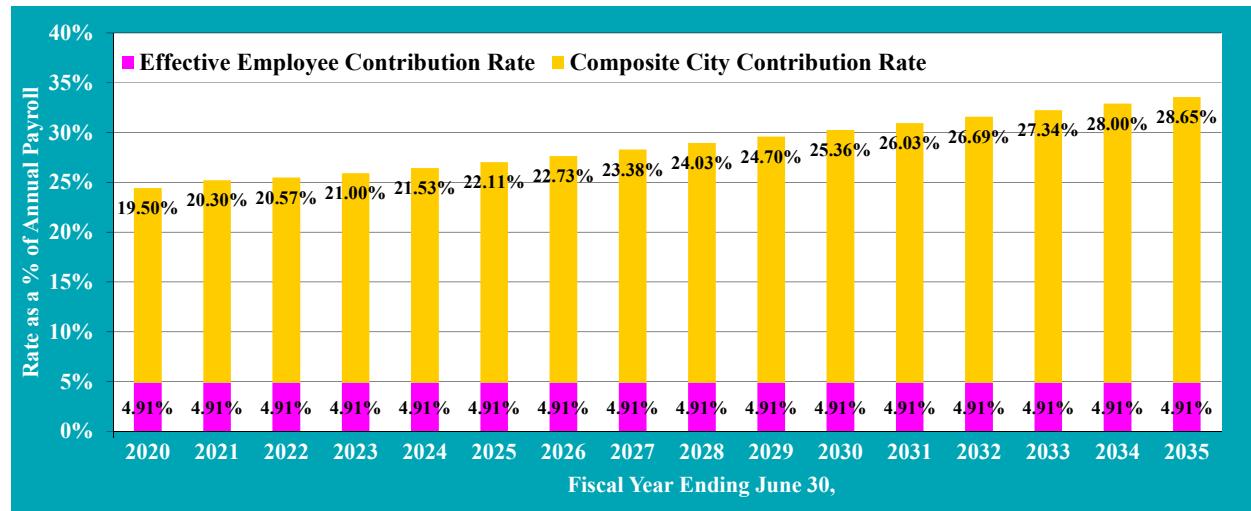
The System would reach a fully funded position by 2029 versus 2040 under the baseline projections. Again, these projections are absent any additional ad hoc COLAs.

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

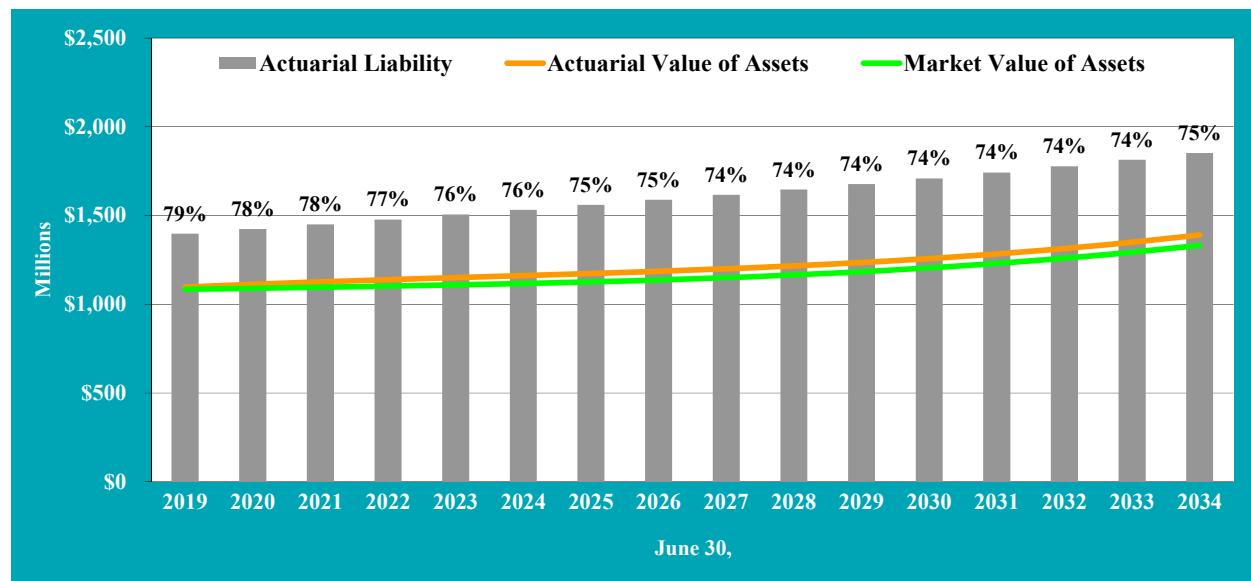
SECTION II – RISK ASSESSMENT AND DISCLOSURE

Projections with Asset Returns of 5.0%

The next two graphs show what the next 15 years would look like with a 5% annual return.



With assets projected to underperform, the City's composite contribution rate would increase steadily from now through the end of the 15-year period.



The System's funded level would ultimately decrease to 75%. This is only a small decrease from the current 79% funded status, but the City would be contributing at a much higher level over this period to make up for the lack of investment earnings. There would still be little danger of benefit commitments going unmet over this period as the System would have nearly 1.5 billion dollars by the end of the period. Again, these projections are absent any additional ad hoc COLAs.

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

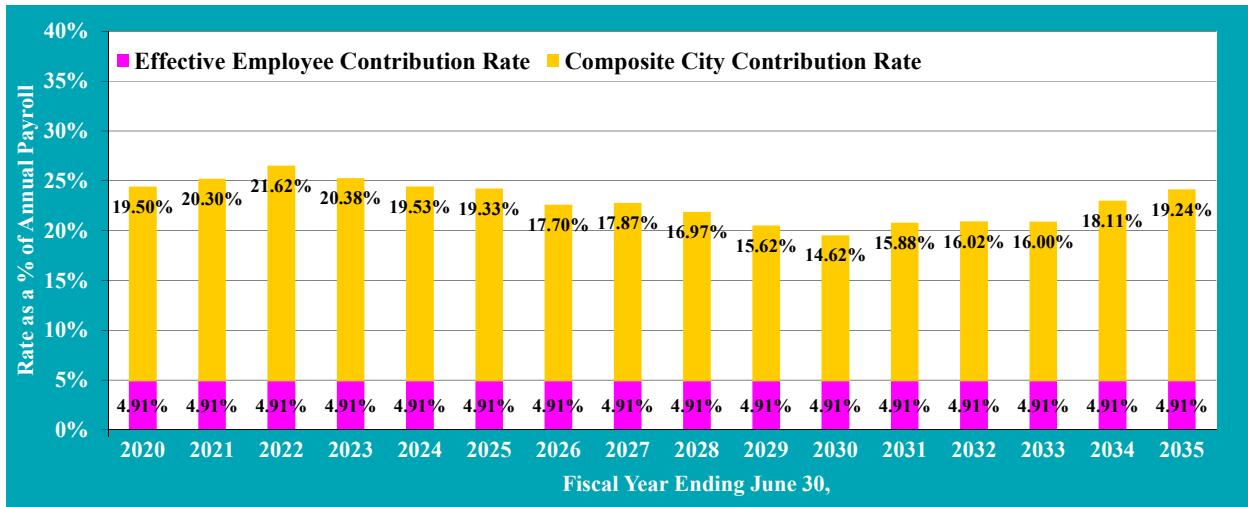
SECTION II – RISK ASSESSMENT AND DISCLOSURE

Projections with Volatile Asset Returns

Similar to the baseline projection, the two projections in this section assumed a fixed return of 9% or 5% each and every year. Whereas this is unlikely, this gives the Board and the City information as to how sensitive the funded status and City's contribution rate is should asset returns routinely exceed or fall short of the assumed 7%. The actual investment performance of the System is likely to be more volatile. The last projection shown below varies the returns for the next 15 years to those that actually occurred from 1957 to 1971 based on a portfolio invested in 60% equities and 40% fixed income, averaging 7.04% over the next 15 years, just above the current assumed return of 7.00%. The rates assumed for this scenario are shown in the following table.

FYE June 30,	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Return	(3.00%)	25.16%	6.80%	3.94%	18.06%	(2.06%)	14.56%	11.82%	7.34%	(5.98%)
FYE June 30,										
Return	12.44%	7.70%	(8.34%)	9.76%	12.98%					

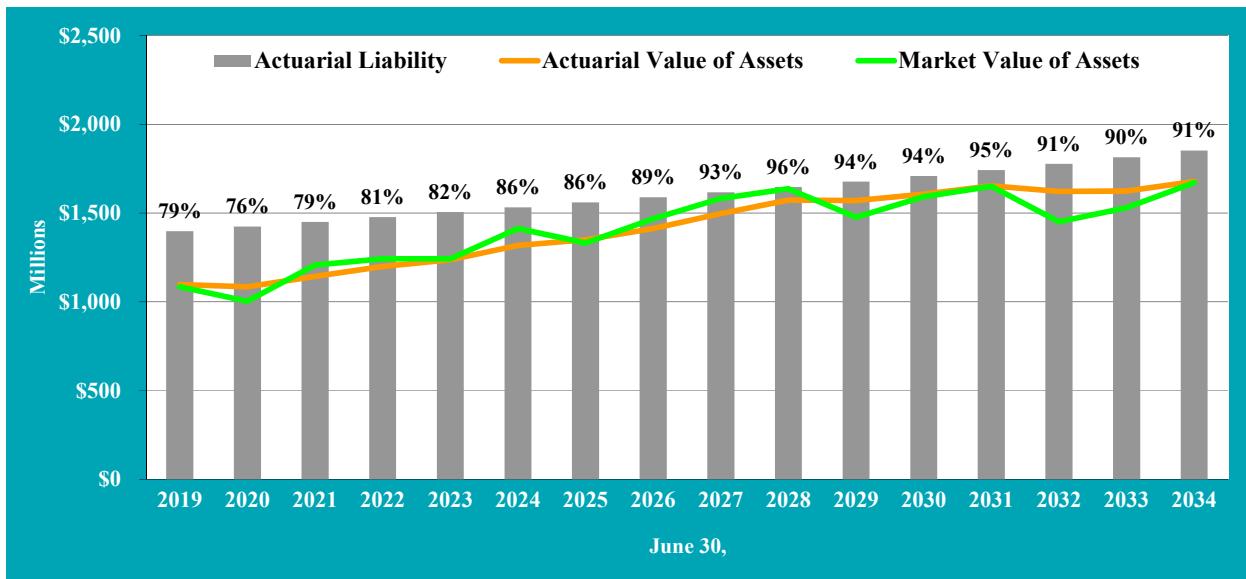
With varying annual earnings, one can see the volatility in the employer contributions in the first chart. Note that this chart reflects an illustrative scenario and is not intended to reflect future expectations as the volatility of the contributions will vary with the volatility of the returns.



THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION II – RISK ASSESSMENT AND DISCLOSURE

The funded ratio of the System is also more volatile with varied returns as seen in the following graph from this one illustrative scenario.



**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

SECTION III – ASSETS

Pension plan assets play a key role in the financial operation of the System and in the decisions the Trustees may make with respect to future deployment of those assets. The level of assets, the allocation of assets among asset classes, and the methodology used to measure assets will likely impact upon benefit levels, City contributions, and the ultimate security of participants' benefits.

In this section, we present detailed information on System assets including:

- **Disclosure** of system assets at June 30, 2018 and June 30, 2019;
- Statement of the **changes** in market values during the year;
- Development of the **actuarial value of assets**;
- An assessment of **investment performance**; and
- A projection of the System's expected **cash flows** for the next ten years.

Disclosure

The market value of assets represents "snap-shot" or "cash-out" values which provide the principal basis for measuring financial performance from one year to the next. Market values, however, can fluctuate widely with corresponding swings in the marketplace. As a result, market values are usually not suitable for long-range planning.

The actuarial value, or "carrying value," is market value which has been smoothed based on actuarial methods used to estimate the long-term asset value. They are used for evaluating the System's ongoing liability to meet its obligations.

Current methods employed by this System determine the actuarial value of assets by first calculating the expected actuarial value of assets based on last year's valuation interest rate, last year's actuarial value of assets, and the net cash flow (contributions less benefit payments) of the System over the year prior to the valuation. One-third of the difference between market value of assets and the expected actuarial value of assets is then added to the expected actuarial value of assets to determine the valuation assets.

The actuarial value of assets is then allocated between the General Employees' portion of the System and that covering Firefighters and Police. The allocation is performed annually based on the actual contribution and benefit payments made on behalf of each type of employee. The investment returns for the year are allocated based on the starting balance and the cash flow of each portion of the Fund.

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION III – ASSETS

Table III-1
Statement of Assets at Market Value
(\$ in Thousands)

	June 30, 2018	June 30, 2019
Assets		
Cash and Short-Term Investments	\$ 24,102	\$ 16,434
Receivables		
Accrued Investment Income	\$ 945	\$ 1,202
Accounts Receivable	14	378
Due from Broker for Securities Sold	<u>47,444</u>	<u>72,934</u>
Total	\$ 48,403	\$ 74,514
Investments, at Fair Value		
United States Treasury Securities	\$ 63,560	\$ 90,301
Fixed Income Securities	113,245	116,275
Derivative Securities	3,562	(1,442)
Equity Securities	78,009	65,957
Balanced Comingled Funds	<u>855,393</u>	<u>877,709</u>
Total	\$ 1,113,769	\$ 1,148,800
Total Assets	\$ 1,186,274	\$ 1,239,748
Liabilities		
Accounts Payable	\$ 2,255	\$ 2,581
Due to Broker for Securities Purchased	<u>108,689</u>	<u>152,919</u>
Total Liabilities	\$ 110,944	\$ 155,500
Net Assets Available for Benefits	\$ 1,075,330	\$ 1,084,248

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION III – ASSETS

Table III-2
Changes in Market Value of Assets
(\$ in Thousands)

Value of Assets – June 30, 2018	\$	1,075,330
<u>Additions</u>		
Contributions		
Employer Contributions	\$	37,079
Employee Contributions		10,009
Total	\$	47,088
Investment Income		
Net Appreciation (Depreciation)	\$	44,518
Interest		4,903
Dividends		6,058
Other		2,094
Total Investment Income	\$	57,573
Investment Expenses		(2,260)
Net Income from Investing Activities	\$	55,313
Total Additions	\$	102,401
<u>Deductions</u>		
Benefits Paid directly to Participants	\$	(86,885)
Return of Contributions		(867)
Beneficiary Payments		(5,114)
Administrative Fees		(617)
Total Deductions	\$	(93,483)
<u>Total</u>		
Net Increase/(Decrease)	\$	8,918
Value of Assets – June 30, 2019	\$	1,084,248

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION III – ASSETS

Actuarial Value of Assets

The actuarial value of assets represents a “smoothed” value developed by the actuary to reduce, or eliminate, erratic results which could develop from short-term fluctuations in the market value of assets. For this System, the actuarial value has been calculated by first calculating the expected actuarial value of assets based on last year’s valuation interest rate, last year’s actuarial value of assets, and the net cash flow (contributions less benefit payments) of the System over the year prior to the valuation. One-third of the market value of assets less the expected actuarial value of assets is then added to the expected actuarial value of assets to determine the valuation assets.

Table III-3
Development of the Actuarial Value of Assets
(\$ in Thousands)

1. Actuarial Value of Assets - June 30, 2018	\$	1,074,892
Employer Contributions		37,079
Employee Contributions		10,009
Benefit Payments		(92,866)
Expected Return at 7.0%		<u>74,938</u>
2. Expected Value at June 30, 2019 (EV)	\$	1,104,052
3. Actual Market Value at June 30, 2019 (AV)	\$	1,084,248
4. One-Third of AV less EV	\$	(6,601)
5. Actuarial Value of Assets - June 30, 2019 [2. + 4.]	\$	1,097,451

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION III – ASSETS

Table III-4
Allocation of Actuarial Value of Assets as of June 30, 2019
(\$ in Thousands)

	General Employees	Firefighters and Police	Total
1. Actuarial Value of Assets at June 30, 2018	\$ 597,998	\$ 476,894	\$ 1,074,892
2. Contributions			
a. City Contributions	\$ 16,714	\$ 20,365	\$ 37,079
b. Member Contributions	<u>5,528</u>	<u>4,481</u>	<u>10,009</u>
c. Total Contributions	\$ 22,242	\$ 24,846	\$ 47,088
3. Benefit Payments ¹	\$ (52,009)	\$ (40,857)	\$ (92,866)
4. Investment Earnings, based on 6.73% return	\$ 38,005	\$ 30,332	\$ 68,337
5. Actuarial Value of Assets at June 30, 2019	\$ 606,236	\$ 491,215	\$ 1,097,451
6. Market Value of Assets at June 30, 2019 ²	\$ 598,943	\$ 485,305	\$ 1,084,248

¹ *Projected Benefit Payments are allocated on the basis of FY 2019 expected payments.*

² *The allocation of Market Value of Assets is used only for comparison to the Present Value of Accrued Benefits.*

**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

SECTION III – ASSETS

Investment Performance

The market value of assets (MVA) returned 5.11% during fiscal year ending June 30, 2019, which is less than the expected 7.00% return (assumption in prior year's valuation) by 1.89%.

A return of 6.73% on the actuarial value of assets (AVA) is primarily the result of the asset smoothing method being utilized for the calculation of the actuarial value of assets. Since only a portion of the gain or loss from the performance of the System is recognized in a given year, in periods of very good performance, the AVA can lag significantly behind the MVA. In a period of negative returns, the AVA does not decline as rapidly as the MVA.

Table III-5
Annual Rates of Return

Year Ending June 30	Market Value	Actuarial Value
1999	9.9%	14.7%
2000	8.8%	11.9%
2001	(2.3%)	5.4%
2002	(7.6%)	(0.9%)
2003	5.4%	(2.5%)
2004	11.1%	9.5%
2005	6.7%	7.2%
2006	4.7%	6.2%
2007	15.1%	8.7%
2008	(5.2%)	4.9%
2009	(15.3%)	(2.1%)
2010	13.1%	(4.6%)
2011	20.2%	4.6%
2012	0.4%	11.2%
2013	11.8%	7.0%
2014	17.1%	10.5%
2015	1.2%	7.3%
2016	0.3%	5.0%
2017	11.4%	7.0%
2018	7.0%	7.1%
2019	5.1%	6.7%

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION III – ASSETS

Table III-6
Projection of System's Benefit Payments and Contributions
(\$ in Thousands)

Fiscal Year Ending	Expected Benefit Payments and Admin Expenses	Expected City Contributions*	Expected Employee Contributions*
2020	\$ 97,122	\$ 38,494	\$ 9,741
2021	98,823	40,597	10,035
2022	100,917	41,835	10,336
2023	101,973	43,069	10,646
2024	106,808	44,317	10,965
2025	107,380	45,534	11,294
2026	109,460	46,784	11,633
2027	112,622	48,021	11,982
2028	114,387	49,338	12,341
2029	115,816	50,667	12,712

* Assumes City contributions are made on July 1 and employee contributions are made uniformly throughout the year.

Expected benefit payments are projected for the closed group valued at June 30, 2019. Projecting any further than ten years using a closed group would not yield reliable predictions due to the omission of new hires. These projections do not include additional ad hoc COLAs, which may be granted by the City Council in future years.

Expected City contributions are shown on a cash basis. Employer contributions were assumed to be made in accordance with the contribution policy adopted by the Board at the July 12, 2017 meeting. That policy includes contributions equal to the employer portion of the Entry Age normal cost for members as of the valuation date (projected based on a current employer normal cost rate of 8.69% with a continued gradual decrease for the plan changes applicable to new hires after June 30, 2018) plus an amortization of the unfunded actuarial liability (UAL) and a load for administrative expenses. The UAL is based on an actuarial value of assets that smooths investment gains and losses over three years and a measurement of the actuarial liability. The UAL is adjusted for one year by increasing it at the assumed interest rate and reducing it by the portion of the City's scheduled contribution not attributable to the value of additional benefits earned (i.e. normal cost.) The resulting projected UAL is then amortized over a 20-year period and turned into a rate by using the anticipated payroll for the plan year commencing one year after the valuation date. The initial UAL, set up concurrent with the June 30, 2017 valuation, is being amortized over a closed 20-year period. Future annual changes to the UAL due to plan changes, assumption changes, gains and losses, including those that arose as a result of this valuation, will be amortized over their own closed 20-year period. All rates are developed using a level percent of pay amortization method with a 3% per year increase. The FY 2021 contribution to be paid July 1, 2020 should be based on the 2019 valuation rate of 20.30%.

**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

SECTION IV – LIABILITIES

In this section, we present detailed information on System liabilities including:

- **Disclosure** of System liabilities at June 30, 2018 and June 30, 2019; and
- Statement of **changes** in these liabilities during the year.

Disclosure

Several types of liabilities are calculated and presented in this report. Each type is distinguished by the people ultimately using the figures and the purpose for which they are using them.

- **Present Value of Future Benefits:** Used for analyzing the financial outlook of the System, this represents the amount of money needed today to fund all future benefits and expenses of the System, assuming participants continue to accrue benefits.
- **Actuarial Liability:** Used for funding calculations, this liability is calculated taking the Present Value of Benefits above and subtracting the present value of future Employer Normal Costs under an acceptable actuarial funding method. This method is referred to as the **Entry Age Normal** funding method.
- **Present Value of Accrued Benefits:** Used for communicating the current level of liabilities, this liability reflects the total amount of money needed today to fully fund the current accrued obligations of the System, assuming no future accruals of benefits, assets continue to earn 7.00% per year and no ad hoc COLAs are awarded. These liabilities are also used to assess whether the Plan can meet its current benefit commitments.

None of the liabilities disclosed in this report is appropriate for use in settling the liabilities of the System.

The tables on the next pages disclose each of these liabilities for the current and prior valuations. With respect to each disclosure, a subtraction of the appropriate value of System assets yields, for each respective type, a **net surplus or unfunded liability**.

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION IV – LIABILITIES

Table IV-1
Liabilities & Net (Surplus)/Unfunded
Combined
(\$ in Thousands)

	June 30, 2018	June 30, 2019
Present Value of Future Benefits		
Active Participant Benefits	\$ 668,709	\$ 657,876
Retiree Benefits	851,958	889,742
DROP Participants	39,773	26,583
Terminated Vested and Inactive Members	<u>58,759</u>	<u>63,396</u>
Present Value of Future Benefits (PVFB)	\$ 1,619,199	\$ 1,637,597
Market Value of Assets (MVA)	\$ 1,075,330	\$ 1,084,248
Future Member Contributions	85,524	85,172
Future City Contributions	<u>458,345</u>	<u>468,176</u>
Total Resources	\$ 1,619,199	\$ 1,637,596
Employer Normal Cost ¹	\$ 17,407	\$ 17,244
Actuarial Liability		
Active Participant Benefits	\$ 427,399	\$ 418,267
Retiree Benefits	851,958	889,742
DROP Participants	39,773	26,583
Terminated Vested and Inactive Members	<u>58,759</u>	<u>63,396</u>
Actuarial Liability (AL)	\$ 1,377,889	\$ 1,397,988
Actuarial Value of Assets (AVA)	1,074,892	1,097,451
Net (Surplus)/Unfunded (AL – AVA)	\$ 302,997	\$ 300,537
Present Value of Accrued Benefits		
Present Value of Accrued Benefits (PVAB)	\$ 1,262,585	\$ 1,285,635
Market Value of Assets (MVA)	<u>1,075,330</u>	<u>1,084,248</u>
Net (Surplus)/Unfunded (PVAB – MVA)	\$ 187,255	\$ 201,387

¹ Net of employee contributions

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION IV – LIABILITIES

Table IV-1
Liabilities & Net (Surplus)/Unfunded
General Employees
(\$ in Thousands)

	June 30, 2018	June 30, 2019
Present Value of Future Benefits		
Active Participant Benefits	\$ 337,242	\$ 319,925
Retiree Benefits	456,517	475,444
Terminated Vested and Inactive Members	<u>40,347</u>	<u>45,045</u>
Present Value of Future Benefits (PVFB)	\$ 834,106	\$ 840,414
 Employer Normal Cost ¹	 \$ 7,873	 7,539
 Actuarial Liability		
Active Participant Benefits	\$ 232,351	\$ 217,283
Retiree Benefits	456,517	475,444
Terminated Vested and Inactive Members	<u>40,347</u>	<u>45,045</u>
Actuarial Liability (AL)	\$ 729,215	\$ 737,772
Actuarial Value of Assets (AVA)	597,998	606,236
Net (Surplus)/Unfunded (AL – AVA)	\$ 131,217	\$ 131,536
 Present Value of Accrued Benefits (PVAB)	 \$ 671,347	 \$ 683,657

¹ Net of employee contributions

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION IV – LIABILITIES

Table IV-1
Liabilities & Net (Surplus)/Unfunded
Fire fighters and Police
(*\$ in Thousands*)

	June 30, 2018	June 30, 2019
Present Value of Future Benefits		
Active Participant Benefits	\$ 331,467	\$ 337,951
Retiree Benefits	395,441	414,298
DROP Participants	39,773	26,583
Terminated Vested and Inactive Members	<u>18,412</u>	<u>18,351</u>
Present Value of Future Benefits (PVFB)	\$ 785,093	\$ 797,183
 Employer Normal Cost ¹	 \$ 9,534	 9,705
 Actuarial Liability		
Active Participant Benefits	\$ 195,048	\$ 200,984
Retiree Benefits	395,441	414,298
DROP Participants	39,773	26,583
Terminated Vested and Inactive Members	<u>18,412</u>	<u>18,351</u>
Actuarial Liability (AL)	\$ 648,674	\$ 660,216
Actuarial Value of Assets (AVA)	476,894	491,215
Net (Surplus)/Unfunded (AL – AVA)	\$ 171,780	\$ 169,001
 Present Value of Accrued Benefits (PVAB)	 \$ 591,238	 \$ 601,978

¹ Net of employee contributions

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION IV – LIABILITIES

Changes in Liabilities

Each of the liabilities disclosed in the prior tables is expected to change at each valuation. The components of that change, depending upon which liability is analyzed, can include:

- New hires since the last valuation
- Benefits accrued since the last valuation
- Plan amendments increasing benefits
- Passage of time which adds interest to the prior liability
- Benefits paid to retirees since the last valuation
- Participants retiring, terminating, or dying at rates different than expected
- A change in actuarial or investment assumptions
- A change in the actuarial funding method

Unfunded liabilities will change because of all of the above, and also due to changes in System assets resulting from:

- Employer contributions different than expected
- Investment earnings different than expected
- A change in the method used to measure plan assets

In each valuation, we report on those elements of change which are of particular significance, potentially affecting the long-term financial outlook of the System. Below we present key changes in liabilities since the last valuation.

Table IV-2
Changes in Liabilities
*(**\$ in Thousands**)*

	Present Value of Benefits	Actuarial Liability	Present Value of Accrued Benefits
Liabilities as of June 30, 2018	\$ 1,619,199	\$ 1,377,889	\$ 1,262,585
Liabilities as of June 30, 2019	\$ 1,637,596	\$ 1,397,988	\$ 1,285,635
Liability Increase/(Decrease)	\$ 18,397	\$ 20,099	\$ 23,050
Change Due to:			
Plan Amendments	\$ 0	\$ 0	\$ 0
Assumption and Method Change	0	0	0
Actuarial (Gain)/Loss	NC	(9,342)	NC
Benefits Accumulated and Other Sources	18,397	29,441	23,050

NC = not calculated

**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

SECTION V – CONTRIBUTIONS

In the process of evaluating the financial condition of any pension plan, the actuary analyzes the assets and liabilities to determine what level (if any) of contributions is needed to properly maintain the funding status of the System. Typically, the actuarial process will use a funding scheme that will result in a pattern of contributions that are both stable and predictable.

For this System, the funding scheme employed is the **Entry Age Actuarial Cost Method**. Under this method, there are three components to the total contribution: the **normal cost rate**, the **unfunded actuarial liability rate** (UAL rate) and the **expense rate**.

The normal cost rate is determined by taking the value, as of entry age into the Plan, of each member's projected future benefits. This value is then divided by the value, also at entry age, of the member's expected future salary.

The second part is an amortization payment to pay off the unfunded actuarial liability (UAL). The unfunded actuarial liability is the difference between the actuarial assets of the System at the valuation date and the assets the System should hold as determined by the actuarial cost method. The UAL is adjusted for one year, by increasing it at the assumed interest rate and reducing it by the portion of the City's scheduled contribution not attributable to the value of additional benefits earned (i.e. normal cost.) The resulting projected UAL is then amortized over a 20-year period and turned into a rate by using the anticipated payroll for the plan year commencing one year after the valuation date. The initial UAL established concurrent with the June 30, 2017 valuation is being amortized over a closed 20-year period. Future annual changes to the UAL due to plan changes, assumption changes, gains and losses, including those established as a result of this valuation, will be amortized over their own closed 20-year period. All rates are developed using a level percent of pay amortization method with a 3% per year increase. Please see Table V-3 for details.

The third piece of the contribution rate accounts for anticipated administrative expenses in the upcoming fiscal year. This rate is determined by averaging the five previous years of administrative expenses relative to the corresponding payroll, rounded up to the nearest 0.05%. This rate was first incorporated with the July 1, 2019 valuation to better align with new accounting standards under GASB No. 67 and 68.

**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

SECTION V – CONTRIBUTIONS

Actuarially Determined Rate

The employer's normal cost rate is 5.91% for General Employees and 13.68% for Firefighters and Police for the fiscal year beginning July 1, 2019. The composite rate is shown in the table below.

The UAL rate is the level percent of member payroll which, when applied to each year's payroll, will be sufficient to amortize the various layers of unfunded actuarial liability over their respective 20-year periods.

The table below presents and compares the actuarially determined contributions for the System for this valuation and the prior one.

Table V-1 Actuarially Determined Rate		
	June 30, 2018	June 30, 2019
Normal Cost Rate	8.65%	8.69%
UAL Rate	10.85%	11.26%
Expense Rate	N/A	0.35%
Total City Rate	19.50%	20.30%

The net increase in the contribution rate was attributable to various sources including a slight increase in the normal cost rate, payroll erosion, unfavorable investment performance and the reflection of an assumed administrative expense rate.

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION V – CONTRIBUTIONS

Table V – 2
Development of UAL Amortization Layer as of June 30, 2019
(\$ in Thousands)

		Firefighters &			
		General	Police	Total	
a.	June 30, 2019 Unfunded Actuarial Liability (UAL)	\$ 131,535	\$ 169,002	\$ 300,537	
b.	Expected Employer Contribution on July 1, 2019	\$ 16,808	\$ 21,686	\$ 38,494	
c.	Employer Normal Cost Payments	(7,539)	(9,705)	(17,244)	
d.	Interest on b. and c. to June 30, 2020	<u>466</u>	<u>601</u>	<u>1,067</u>	
e.	Net Contribution to apply to UAL	\$ 9,735	\$ 12,582	\$ 22,317	
f.	Interest on UAL to June 30, 2020	\$ 9,207	\$ 11,830	\$ 21,037	
g.	June 30, 2020 Expected Unfunded Actuarial Liability (a. – e. + f.)	\$ 131,007	\$ 168,250	\$ 299,257	
h.	Outstanding Balances for Amortization Bases as of June 30, 2020	\$ 130,105	\$ 171,118	\$ 301,223	
i.	June 30, 2020 Experience UAL Layer [g. – h.]	\$ 902	\$ (2,868)	\$ (1,966)	
j.	June 30, 2020 Layer Amortized Over 20 Years	\$ 63	\$ (201)	\$ (138)	

Since contributions are payable a year after they are developed, the UAL is amortized over 20 years on July 1, 2020.

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION V – CONTRIBUTIONS

Type of Base	Date Established	June 30, 2019		FY 2020		June 30, 2020 Outstanding Balance	Remaining Amortization Years	June 30, 2020 Amortization Payment
		Initial Amount		Amortization Payment				
GENERAL EMPLOYEES								
1. 2017 Initial Unfunded Base	7/1/2017	\$ 129,578	\$ 9,383	\$ 128,302	18	\$ 9,664		
2. 2018 Plan Change	7/1/2018	6,542	491	6,965	19	506		
3. 2018 Experience Base	7/1/2018	(4,903)	(364)	(5,162)	19	(375)		
4. 2019 Experience Base	7/1/2019	318	N/A	902	20	63		
General Employees Total		\$ 131,535	\$ 9,510	\$ 131,007		\$ 9,858		
FIREFIGHTERS AND POLICE								
1. 2017 Initial Unfunded Base	7/1/2017	\$ 162,628	\$ 11,876	\$ 162,394	18	\$ 12,232		
2. 2018 Plan Change	7/1/2018	5,216	391	5,553	19	403		
3. 2018 Experience Base	7/1/2018	3,936	223	3,171	19	230		
4. 2019 Experience Base	7/1/2019	(2,778)	N/A	(2,868)	20	(201)		
Firefighters and Police Total		\$ 169,002	\$ 12,490	\$ 168,250		\$ 12,664		
Combined Total				\$ 299,257		\$ 22,522		

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION V – CONTRIBUTIONS

Table V-4
Development of Actuarially Determined Contribution Rate
Composite Rate
(\$ in Thousands)

	June 30, 2018 (expensed FY 2019)	June 30, 2019 (expensed FY 2020)
	(paid FY 2020)	(paid FY 2021)
1. Actuarial Liability		
a. Active Employees	\$ 427,399	\$ 418,267
b. Retired Members	851,958	889,742
c. DROP Participants	39,773	26,583
d. Vested Terminated Members	<u>58,759</u>	<u>63,396</u>
e. Total Actuarial Liability	\$ 1,377,889	\$ 1,397,988
2. Actuarial Value of Assets	\$ 1,074,892	\$ 1,097,451
3. Unfunded Actuarial Liability (UAL) [1. - 2.]	\$ 302,997	\$ 300,537
4. UAL Amortization Payments	\$ 21,999	\$ 22,522
5. Active Member Payroll for UAL Amortization	\$ 202,818	\$ 199,983
6. Employer Contribution Results		
a. Employer Normal Cost Rate	8.65%	8.69%
b. Amortization of UAL [4. ÷ 5.]	10.85%	11.26%
c. Administrative Expenses	<u>N/A</u>	<u>0.35%</u>
d. Total Employer Contribution Rate	19.50%	20.30%

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION V – CONTRIBUTIONS

Table V-4
Development of Actuarially Determined Contribution Rate
General Employees
(\$ in Thousands)

	June 30, 2018 (expensed FY 2019)	June 30, 2019 (expensed FY 2020)
	(paid FY 2020)	(paid FY 2021)
1. Actuarial Liability		
a. Active Employees	\$ 232,351	\$ 217,283
b. Retired Members	456,517	475,444
d. Vested Terminated Members	<u>40,347</u>	<u>45,045</u>
e. Total Actuarial Liability	\$ 729,215	\$ 737,772
2. Actuarial Value of Assets	\$ 597,998	\$ 606,236
3. Unfunded Actuarial Liability (UAL) [1. - 2.]	\$ 131,217	\$ 131,536
4. UAL Amortization Payments	\$ 9,509	\$ 9,858
5. Active Member Payroll for UAL Amortization	\$ 130,874	\$ 128,515
6. Employer Contribution Results		
a. Employer Normal Cost Rate	6.06%	5.91%
b. Amortization of UAL [4. ÷ 5.]	7.27%	7.67%
c. Administrative Expenses	<u>N/A</u>	<u>0.35%</u>
d. Total Employer Contribution Rate	<u>13.33%</u>	<u>13.93%</u>

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION V – CONTRIBUTIONS

Table V-4
Development of Actuarially Determined Contribution Rate
Firefighters and Police
(\$ in Thousands)

	June 30, 2018 (expensed FY 2019)	June 30, 2019 (expensed FY 2020)
	(paid FY 2020)	(paid FY 2021)
1. Actuarial Liability		
a. Active Employees	\$ 195,048	\$ 200,984
b. Retired Members	395,441	414,298
c. DROP Participants	39,773	26,583
d. Vested Terminated Members	<u>18,412</u>	<u>18,351</u>
e. Total Actuarial Liability	\$ 648,674	\$ 660,216
2. Actuarial Value of Assets	\$ 476,894	\$ 491,215
3. Unfunded Actuarial Liability (UAL) [1. - 2.]	\$ 171,780	\$ 169,001
4. UAL Amortization Payments	\$ 12,490	\$ 12,664
5. Active Member Payroll for UAL Amortization	\$ 71,944	\$ 71,468
6. Employer Contribution Results		
a. Employer Normal Cost Rate	13.35%	13.68%
b. Amortization of UAL [4. ÷ 5.]	17.36%	17.72%
c. Administrative Expenses	<u>N/A</u>	<u>0.35%</u>
d. Total Employer Contribution Rate	30.71%	31.75%

**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

SECTION VI – FINANCIAL STATEMENT INFORMATION

Accounting Standard Codification Topic No. 960 of the Financial Accounting Standards Board specifies certain information for a plan to disclose regarding its funded status. FASB ASC Topic No. 960 disclosures provide a quasi “snap shot” view of how the plan’s assets compare to its liabilities if contributions stopped and accrued benefit claims had to be satisfied. However, due to potential legal requirements and the possibility that alternative interest rates would have to be used to determine the liabilities, these values may not be a good indication of the amount of money it would take to buy the benefits for all members if the Plan were to terminate.

The present value of accrued benefits (FASB ASC Topic No. 960) is determined assuming that the System is on-going and participants continue to terminate employment, retire, etc., in accordance with the actuarial assumptions. Liabilities are discounted at the assumed valuation interest rate of 7.0% per annum.

FASB ASC Topic No. 960 specifies that a comparison of the present value of accrued (accumulated) benefits with the market value of the assets as of the valuation date must be provided. Table VI-1 shows the FASB liabilities as of June 30, 2018 and June 30, 2019. Table VI-2 then reconciles the FASB ASC Topic No. 960 liabilities determined as of the prior valuation, June 30, 2018, to the liabilities as of June 30, 2019.

Tables VI-3 can be used with the City’s CAFR. Table VI-3 is the Schedule of Funded Liabilities by Type which shows the portion of Accrued Liability covered by Assets.

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION VI – FINANCIAL STATEMENT INFORMATION

Table VI-1
Accounting Statement Information
(\$ in Thousands)

	June 30, 2018	June 30, 2019
FASB ASC Topic No. 960		
1. Present Value of Benefits Accrued and Vested to Date		
a. Members Currently Receiving Payments	\$ 851,958	\$ 889,742
b. Vested Terminated Members	98,531	89,979
c. Active Members	<u>301,697</u>	<u>295,546</u>
d. Total PVVB	<u>\$ 1,252,186</u>	<u>\$ 1,275,267</u>
2. Present Value of Non-Vested Accrued Benefits for Active Members	<u>10,399</u>	<u>10,368</u>
3. Total Present Value of Accrued Benefits	<u>\$ 1,262,585</u>	<u>\$ 1,285,635</u>
4. Assets at Market Value	\$ 1,075,330	\$ 1,084,248
5. Unfunded Present Value of Accrued Benefits [3. - 4., not less than 0]	\$ 187,255	\$ 201,387
6. Ratio of Assets to Value of Benefits [4. ÷ 3.]	85.2%	84.3%

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION VI – FINANCIAL STATEMENT INFORMATION

Table VI-2
Statement of Changes in Total Actuarial Present Value of All Accrued Benefits
(\$ in Thousands)

FASB ASC Topic No. 960	Accumulated Benefit Obligation
Actuarial Present Value of Accrued Benefits as of June 30, 2018	\$ 1,262,585
Increase/(Decrease) During Years Attributable to:	
Passage of Time	\$ 85,131
Benefits Paid during FY 2018-2019	(92,866)
Change in Assumptions	0
Plan Changes	0
Benefits Accrued, Other Gains/Losses	<u>30,785</u>
Net Increase/(Decrease)	\$ 23,050
Actuarial Present Value of Accrued Benefits as of June 30, 2019	\$ 1,285,635

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

SECTION VI – FINANCIAL STATEMENT INFORMATION

Table VI-3
Schedule of Funded Liabilities by Type
Aggregate Accrued Liabilities
(\$ in Thousands)

Valuation Date	(1)		(2)		(3)		Portion of Accrued Liabilities		
	Active Member Contributions	Vested Terms, Beneficiaries	Retirees,	Active Members	(Employer Financed Portion)	Reported Assets¹	Covered by Reported Assets	(1)	(2)
July 1 2002	N/A	\$ 372,748	\$ 411,905	\$ 798,071	100%	100%	100%	100%	100%
2003	N/A	397,311	415,926	760,503	100%	100%	100%	87%	
2004	\$ 215	421,471	423,984	816,120	100%	100%	100%	93%	
2005	198	469,436	414,296	854,146	100%	100%	100%	93%	
2006	84	566,233	372,780	881,036	100%	100%	100%	84%	
2007	83	585,584	386,564	925,821	100%	100%	100%	88%	
2008	79	605,567	403,409	937,767	100%	100%	100%	82%	
2009	72	617,813	411,732	885,609	100%	100%	100%	65%	
2010	55	637,489	409,218	817,698	100%	100%	100%	44%	
2011	197	658,832	404,945	831,975	100%	100%	100%	43%	
2012	770	768,508	375,129	923,199	100%	100%	100%	41%	
2013	1,780	782,860	375,074	954,499	100%	100%	100%	45%	
2014	3,451	816,288	377,728	1,011,523	100%	100%	100%	51%	
2015	8,425	850,742	365,456	1,038,059	100%	100%	100%	49%	
2016	15,493	877,143	361,774	1,048,346	100%	100%	100%	43%	
2017	21,937	921,087	392,802	1,043,620	100%	100%	100%	26%	
2018	29,427	950,489	397,973	1,074,892	100%	100%	100%	24%	
2019	34,844	979,721	383,423	1,097,451	100%	100%	100%	22%	

¹ Reported assets are actuarial value of assets. If assets were market value of assets, results would differ.

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

APPENDIX A – MEMBERSHIP INFORMATION

Table A-1
Summary of Active Membership as of June 30, 2019 ¹

Plan	Count	Average Age	Average Service	Average Salary
General	2,599	47.3	9.8	\$ 49,084
Firefighters and Police	1,140	39.7	11.8	62,230
Total System	3,739	45.0	10.4	\$ 53,092

¹ Excludes those on Leave of Absence

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

APPENDIX A – MEMBERSHIP INFORMATION

Table A-2
Summary of Inactive Membership as of June 30, 2019
(\$ in Thousands)

	Count	Annual Benefit		Average Annual Benefit
Service Retirees				
General	2,280	\$ 44,336	\$	19.4
Firefighters and Police	960	34,315		35.7
Total	3,240	\$ 78,651		24.3
DROP Participants¹				
General	0	\$ 0	\$	0
Firefighters and Police	47	1,489		31.7
Total	47	\$ 1,489		31.7
Contingent Annuitants				
General	348	\$ 3,048	\$	8.8
Firefighters and Police	209	2,660		12.7
Total	557	\$ 5,708		10.2
Disableds				
General	184	\$ 2,514	\$	13.7
Firefighters and Police	138	3,187		23.1
Total	322	\$ 5,701		17.7
Vested Former Members²				
General	1,049	\$ 6,286	\$	6.0
Firefighters and Police	307	4,294		14.0
Total	1,356	\$ 10,580		7.8

¹ For those in the DROP period, the amount shown is 70% of the full monthly benefit.

² Benefits are payable at age 60 for General Employees and age 55 for Firefighters and Police. Includes 23 participants on leave of absence that are currently vested.

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

APPENDIX A – MEMBERSHIP INFORMATION

Table A-3
Data Reconciliation¹

	Vested							
	Former		Service	DROP	Contingent			
	Actives	Members²	Retirements	Participants	Annuitants	Disableds	Total	
Count as of June 30, 2018	3,836	1,285	3,125	69	549	320	9,184	
New Entrants	450	5	1	0	3	0	459	
Terminations/Retirements								
- Vested	(262)	130	116	16	0	0	0	
- Non-Vested	(282)	0	0	0	0	0	(282)	
Disablements	(6)	(4)	0	0	0	10	0	
Vested								
- that Retired	0	(42)	42	0	0	0	0	
- that Returned to Work	5	(5)	0	0	0	0	0	
DROP Retirements	0	0	38	(38)	0	0	0	
Deaths								
- With a Beneficiary	(2)	0	(27)	0	32	(3)	0	
- Without a Beneficiary	NC	(13)	(55)	0	(27)	(5)	(100)	
Count as of June 30, 2019	3,739	1,356	3,240	47	557	322	9,261	

¹ Reconciliation excludes participants due an account balance and non-vested participants on Leave of Absence.

² 23 and 19 participants on Leave of Absence as of June 30, 2018 and June 30, 2019, respectively, are entitled to a vested benefit and thus included as Vested Former Members.

NC = Not Calculated. Active participants who died during the plan year are included in the non-vested terminations.

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

APPENDIX A – MEMBERSHIP INFORMATION

Table A-4
Distribution of Active Participants - General Employees
(\$ in Thousands)

Age	COUNTS BY AGE/SERVICE										Total
	Service										
Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up		
Under 25	30	19	0	0	0	0	0	0	0	0	49
25 to 29	78	107	18	1	0	0	0	0	0	0	204
30 to 34	70	131	59	25	0	0	0	0	0	0	285
35 to 39	43	120	71	43	13	0	0	0	0	0	290
40 to 44	42	88	57	47	30	8	0	0	0	0	272
45 to 49	33	80	60	45	51	28	13	0	0	0	310
50 to 54	29	85	71	43	59	36	21	11	0	0	355
55 to 59	19	63	54	65	55	46	28	40	7	2	379
60 to 64	10	35	44	50	47	43	21	29	22	11	312
65 to 69	0	10	27	21	12	4	4	13	9	8	108
70 & up	1	2	5	3	4	7	2	5	3	3	35
Total	355	740	466	343	271	172	89	98	41	24	2,599

Age	TOTAL SALARY BY AGE/SERVICE										Total
	Service										
Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up		
Under 25	956	629	0	0	0	0	0	0	0	0	1,585
25 to 29	2,684	4,000	697	52	0	0	0	0	0	0	7,433
30 to 34	2,581	5,600	2,534	979	0	0	0	0	0	0	11,694
35 to 39	2,508	5,401	3,311	2,277	577	0	0	0	0	0	14,073
40 to 44	1,560	4,162	3,115	2,291	1,489	438	0	0	0	0	13,055
45 to 49	1,378	3,502	3,536	2,317	2,998	1,669	793	0	0	0	16,193
50 to 54	1,090	4,264	3,250	2,147	2,734	1,917	1,190	656	0	0	17,248
55 to 59	962	3,203	3,070	3,364	2,871	2,679	1,571	2,290	439	153	20,601
60 to 64	480	1,822	2,737	2,491	2,324	2,277	1,379	1,751	1,306	633	17,199
65 to 69	0	586	1,870	1,102	559	174	177	806	736	603	6,612
70 & up	50	70	211	103	190	415	150	266	230	189	1,875
Total	14,249	33,239	24,330	17,124	13,743	9,568	5,260	5,768	2,711	1,578	127,569

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

APPENDIX A – MEMBERSHIP INFORMATION

Table A-4
Distribution of Active Participants (including DROP) - Firefighters & Police
(*\$ in Thousands*)

Age	Counts by Age/Service										Total
	Service										
Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up		
Under 25	26	39	0	0	0	0	0	0	0	0	65
25 to 29	25	105	53	0	0	0	0	0	0	0	183
30 to 34	12	34	93	43	1	0	0	0	0	0	183
35 to 39	4	17	39	79	29	0	0	0	0	0	168
40 to 44	2	7	16	49	65	20	0	0	0	0	159
45 to 49	3	0	12	38	58	53	10	0	0	0	174
50 to 54	2	2	7	26	22	58	28	5	0	0	150
55 to 59	0	0	1	1	11	19	17	17	9	1	76
60 to 64	0	0	0	1	2	5	4	7	5	4	28
65 to 69	0	0	0	0	0	0	0	0	0	0	0
70 & up	0	0	0	0	0	0	1	0	0	0	1
Total	74	204	221	237	188	155	60	29	14	5	1,187

Age	Total Salary by Age/Service										Total
	Service										
Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up		
Under 25	1,040	1,749	0	0	0	0	0	0	0	0	2,789
25 to 29	1,037	4,840	2,731	0	0	0	0	0	0	0	8,608
30 to 34	501	1,541	4,910	2,521	72	0	0	0	0	0	9,545
35 to 39	180	800	2,100	4,840	1,873	0	0	0	0	0	9,792
40 to 44	80	322	827	2,889	4,448	1,457	0	0	0	0	10,024
45 to 49	127	0	604	2,236	4,010	3,858	813	0	0	0	11,649
50 to 54	80	90	354	1,495	1,425	4,168	2,237	478	0	0	10,328
55 to 59	0	0	49	54	703	1,307	1,304	1,595	822	77	5,911
60 to 64	0	0	0	57	135	327	296	589	480	387	2,271
65 to 69	0	0	0	0	0	0	0	0	0	0	0
70 & up	0	0	0	0	0	0	25	0	0	0	25
Total	3,045	9,341	11,576	14,093	12,666	11,118	4,675	2,663	1,301	464	70,942

* Tables above include 47 participants in DROP

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

A. Actuarial Assumptions

Interest Rate

7.0% per annum, compounded annually (originally adopted as of June 30, 2012).

Mortality

Pre-Retirement: 108% of RP-2014 adjusted back to 2006 using MP-2014 and brought forward to 2016 using MP-2016 and generational improvements of 0.75% per year (ages < 86) thereafter*

Healthy Annuitants: 108% of RP-2014 adjusted back to 2006 using MP-2014 and brought forward to 2016 using MP-2016 and generational improvements of 0.75% per year (ages < 86) thereafter

Disableds: 100% of RP-2014 Disability Mortality adjusted back to 2006 using MP-2014 and brought forward to 2016 using MP-2016 and generational improvements of 0.75% per year (ages < 86) thereafter

* 5% of deaths are assumed to be accidental for general employees;
60% of deaths are assumed to be accidental for firefighters and police.

Salary Increase

Representative values are as follows:

Annual Rate of Salary Increase		
Service	General	Firefighters and Police
0	6.60 %	9.69 %
1	6.45	6.60
2	6.30	6.60
3	6.14	6.60
4	5.99	6.60
5	5.83	6.60
10	5.34	6.60
15	5.18	6.60
20	4.74	5.68
25	4.23	5.06
30	3.71	5.06

The table above includes an annual inflation rate of 3.00%.

**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

Withdrawal

Service	General	Firefighters and Police
0	19.00 %	10.00 %
1	17.00	9.00
2	15.00	8.00
3	13.00	7.00
4	11.00	6.00
5	9.50	5.00
10	4.70	2.80
15	3.00	1.00
20	2.50	1.00
25	1.00	1.00
30	1.00	1.00

Disability

Age	General*			Firefighters and Police**
	Male	Female	Unisex	Firefighters and Police**
20	0.06%	0.05%	0.04%	
25	0.07	0.05	0.06	
30	0.08	0.06	0.08	
35	0.13	0.10	0.11	
40	0.20	0.15	0.22	
45	0.31	0.23	0.40	
50	0.46	0.35	0.67	
54	0.59	0.45	0.90	
55	0.63	0.48	0.96	
59	0.92	0.70	1.26	

* 25% of General disabilities are assumed to be accidental

**70% of Police & Fire disabilities are assumed to be accidental

THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

Retirement

General:

Age	Early Retirement	Normal Service Retirement			
		Hired Before 7/1/2018	Social Security NRA 65	Social Security NRA 66	Social Security NRA 67
50	7.50 %	7.50 %	7.50 %	7.50 %	7.50 %
51	7.50	7.50	7.50	7.50	7.50
52	7.50	7.50	7.50	7.50	7.50
53	7.50	7.50	7.50	7.50	7.50
54	7.50	7.50	7.50	7.50	7.50
55	7.50	7.50	7.50	7.50	7.50
56	7.50	7.50	7.50	7.50	7.50
57	7.50	7.50	7.50	7.50	7.50
58	7.50	7.50	7.50	7.50	7.50
59	7.50	7.50	7.50	7.50	7.50
60		15.00	7.50	7.50	7.50
61		15.00	7.50	7.50	7.50
62		15.00	7.50	7.50	7.50
63		15.00	7.50	7.50	7.50
64		15.00	7.50	7.50	7.50
65		25.00	25.00	7.50	7.50
66		15.00	15.00	25.00	7.50
67		15.00	15.00	15.00	25.00
68		15.00	15.00	15.00	15.00
69		15.00	15.00	15.00	15.00
70		100.00	100.00	100.00	100.00

**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

Firefighters and Police:

For those eligible for the Deferred Retirement Option Program (DROP):

Service	Rate of Retirement*
20	2.50%
21	3.00
22	3.50
23	4.00
24	15.00
25	30.00
26	30.00
27 and up	30.00

For those not eligible for the Deferred Retirement Option Program (DROP):

Service	Rate of Retirement*
20	2.50%
21	3.00
22	3.50
23	4.00
24	15.00
25	20.00
26	20.00
27 and up	20.00

* In lieu of the rates above, any active participant at least age 65 is assumed to retire immediately.

NOTE: Rates apply to each member based on eligibility requirements as defined in the Summary of Benefit and Contribution Provisions.

Future Expenses

Administrative expenses are assumed to be 0.35% of payroll. The assumed interest rate is net of the anticipated investment expenses of the Employees' Retirement System.

Loading or Contingency Reserves

A load of 1.00% for General Employees and 1.15% for Firefighters and Police is applied to retirement benefits for active employees to account for unused sick leave balances at time of retirement.

**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

Marital Status

65% of the General Employees and 75% of the Firefighters and Police are assumed to be married, with males three years older than females.

DROP Election

All Firefighters and Police who are eligible to elect DROP are assumed to do so in lieu of retirement.

Rationale for Economic and Demographic Assumptions

Assumptions were set by the Board of Trustees on the basis of recommendations made by Cheiron as a result of an experience study covering the period from July 1, 2011 through June 30, 2016.

Changes in Assumptions

Retirement rates for General Employees hired on or after July 1, 2018 were updated to better reflect anticipated experience under the new plan provisions.

An expense load of 0.35% of payroll was implemented to better align with accounting standards under GASB No. 67 and 68 for the expected long-term investment return being net of only investment expenses.

**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

Actuarial Methods

Actuarial Cost Method:

Entry Age Normal Cost Method. The unfunded actuarial liability (UAL) as of June 30, 2019 was projected to June 30, 2020 based on interest and the portion of the City contribution being paid during the fiscal year ending June 30, 2020 not attributable to additional benefits being earned. Future annual changes in the UAL due to Plan changes and gains and losses will be amortized over their own closed 20-year periods. All rates are developed using a level-percent of pay amortization method with a 3% per annum increase in the payments.

City contributions assumed to occur on the July 1 following the valuation date to be made on the basis of the rates developed in this valuation applied to actual covered payroll (including DROP payroll) of the City during the previous October.

Asset Valuation Method:

The actuarial value of assets is determined by first calculating the expected actuarial value of assets based on last year's valuation interest rate, last year's actuarial value of assets, and the net cash flow (contributions less benefit payments) of the System over the year prior to the valuation. One-third of the market value of assets less the expected actuarial value of assets is then added to the expected actuarial value of assets to determine the valuation assets.

Changes in Actuarial Methods

None

**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

The following is intended to summarize the key benefits valued in this valuation. Members of the System and other parties should not rely on this summary as a substitute for or interpretation of the laws and ordinances of the Norfolk City Code covering this retirement plan.

1. Membership

Any permanent regular full-time employee entering the service of the City of Norfolk is required to become a member of the Retirement System. Upon entering the System, members are classified according to their occupational group, either as General Employees, Firefighters, Police Officers, or Paramedics.

Paramedics, formerly members of the General Employees Group, were reclassified as members of Firefighters and Police effective June 9, 1992. City Council members on or after July 1, 2001, are classified as members of Firefighters and Police.

For each full calendar year beginning on or after January 1, 1997, any permanent part-time employees shall be members of and entitled to benefits in proportion to which their annual hours bear to that of full-time employees.

A member, who was a Norfolk Community Services Board employee on June 30, 2012, who became a City employee on July 1, 2012, began participating in this retirement plan on such date. Prior service for these employees was credited towards benefit eligibility only. Lastly, these employees were exempt from the member's mandatory contributions applicable to anyone hired on or after October 5, 2010 until January 8, 2015.

2. Normal Service Retirement Allowance

Eligibility

Employees Hired Before July 1, 2018

For General Employees, the earlier of age 60 or 30 years of creditable service.

For Firefighters, Police Officers, and Paramedics, the earlier of age 55 or 25 years of creditable service. Mandatory retirement is age 65 for Firefighters and Police Officers.

Employees Hired On or After July 1, 2018

For General Employees, the earlier of the retirement age as defined under the Social Security Act (42 U.S.C §416) or the age at which the combination of a participant's age and service sums to at least 90.

For Firefighters, Police Officers, and Paramedics, the earlier of age 60 or age 50 with 25 years of creditable service. Mandatory retirement is age 65 for Firefighters and Police Officers.

**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

Amount

Employees Hired Before July 1, 1980

For General Employees, the pension earned is 2% of average final compensation for each year of creditable service.

Effective January 1, 1997 for General Employees, the maximum number of years of creditable service is the greater of 35 years or the number of years of service as of December 31, 1996.

For Firefighters, Police Officers, and Paramedics, the pension earned is 2.5% of average final compensation for each year of creditable service up to a maximum of 65% of average final compensation.

Employees Hired Between July 1, 1980 and June 30, 2018

For General Employees, the pension earned is 1.75% of average final compensation for each year of creditable service up to a maximum of 35 years.

For Firefighters, Police Officers, and Paramedics, the pension earned is 2.5% of average final compensation for each year of creditable service up to a maximum of 65% of average final compensation.

“Average Final Compensation” means the average annual earnable compensation for the three years of creditable service which produces the highest average. Creditable service consists of membership service plus 100% of accumulated unused sick leave for all employees except Firefighters. For Firefighters, 46% of unused sick leave accumulated prior to July 1, 1985 and 100% of unused sick leave accumulated on and after July 1, 1985 is included.

Employees Hired On or After July 1, 2018

For General Employees, the pension earned is 1.75% of average final compensation for each year of creditable service up to a maximum of 35 years.

For Firefighters, Police Officers, and Paramedics, the pension earned is 2.5% of average final compensation for each year of creditable service up to a maximum of 65% of average final compensation.

“Average Final Compensation” means the average annual earnable compensation for the five years of creditable service which produces the highest average. Creditable service consists of membership service plus 100% of accumulated unused sick leave for all employees except Firefighters. For Firefighters, 46% of unused sick leave accumulated prior to July 1, 1985 and 100% of unused sick leave accumulated on and after July 1, 1985 is included.

**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

3. Early Service Retirement Allowance

Eligibility

Within five years of eligibility for normal service retirement.

Amount

Accrued service retirement allowance deferred to normal service retirement age. A member may elect to receive an immediate benefit equal to the accrued service retirement allowance reduced by $\frac{1}{4}$ of 1% for each month commencement date precedes the normal retirement date for General Employees, and $\frac{1}{2}$ of 1% for each month commencement date precedes the normal retirement date for firefighters, police officers, and paramedics.

4. Vested Allowance

Eligibility

Five years of creditable service.

Amount

Accrued service retirement allowance deferred to normal retirement age. If not eligible for retirement, a member may elect to leave their contributions made prior to July 1, 1972 with interest, if any, in the System until normal service retirement date.

5. Ordinary Disability Retirement Allowance

Eligibility

Five years of creditable service and total and permanent disability not due to an accident in the performance of duty.

Amount

Accrued service retirement allowance with a minimum of 25% of average final compensation. The minimum cannot exceed the normal service retirement allowance based on average final compensation and creditable service projected to normal service retirement date.

**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

6. Accidental Disability Retirement Allowance

Eligibility

Total and permanent disability as a result of an accident in the performance of duty, regardless of length of service. Applications must be filed within six years from the date of accident.

The disability of a firefighter, police officer, sheriff, or deputy sheriff caused by hypertension, heart disease, or respiratory disease is presumed to have been suffered in the line of duty unless the contrary is shown by medical evidence.

Amount

The amount payable is 66 $\frac{2}{3}$ % of average final compensation.

7. Ordinary Death Benefit

Eligibility

Death in active service due to causes not the result of an accident in the performance of duty. Benefits are paid to a designated beneficiary or estate.

Amount

All contributions, if any, made by the member with not less than one-half of the interest credited are paid. In addition, if the member had one year of creditable service if he became a member prior to July 1, 1979 and five years of creditable service if he became a member on or after July 1, 1979, an additional lump-sum benefit equal to 50% of their earnable compensation during the year immediately preceding their death is payable. If a member dies in service after the earlier of completion of 10 years of service or early service retirement eligibility and if the designated beneficiary for the lump-sum death benefit is the spouse, the spouse may elect to receive, in lieu of the lump sum death benefit, a monthly pension payable until death or remarriage. If the member was eligible for early or normal service retirement, the spouse's benefit is equal to one-half of the retirement allowance that would have been payable to the member had the member retired and immediately commenced payment. If the member was not eligible for early or normal service retirement, the spouse's benefit is equal to one-half of the normal service retirement allowance, which would have been payable to the member if he or she had been vested, such benefit to commence at the same time as the vested benefit would have been paid to the member. If the spouse dies or remarries before the youngest unmarried child attains age 18, the pension shall continue to the date that all the children have died, married, or attained age 18, whichever occurs first. If the spouse was receiving benefits on or before June 30, 1978, payments shall continue after remarriage with no further payments after death.

**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

8. Accidental Death Benefit

Eligibility

Death in active service resulting from an accident in the performance of duty within six years from the date of the accident. The death of a firefighter, police officer, sheriff, or deputy sheriff caused by hypertension, heart disease, or respiratory disease in the case of firefighters is presumed to have been suffered in the line of duty unless the contrary is shown by medical evidence.

Amount

Fifty percent of average final compensation is payable to the spouse until death or remarriage. If there is no spouse or if the spouse dies or remarries, the benefit is payable to children under age 18 or dependent parents. In addition, all contributions, if any, made by the member with interest credited are paid to their designated recipient or estate. If there is no spouse, a lump-sum benefit equal to 50% of their earnable compensation during the year immediately preceding their death is payable.

Offset on Account of Workers' Compensation

All benefits paid under the provisions of any workers' compensation act or any similar law to any member or beneficiary, or to the dependents of any member or beneficiary on account of any disability or death are in such manner as the Board determines, offset against any benefits provided from City contributions to the Employees' Retirement System.

9. Death Benefit After Retirement

Eligibility

Death of a retired member receiving retirement allowance payments and who completed five years of creditable service, if they became a member after July 1, 1979, or of a spouse receiving an accidental death benefit.

Amount

Lump-sum equal to one-half of the average final compensation on which the retirement allowance of the deceased retired member or spouse was based. The lump-sum is payable to the surviving spouse, to unmarried children under age 18, or unmarried children over age 18 who are physically or mentally unable to make a living.

In the case of a retired member who dies and leaves a surviving spouse, the spouse may elect to receive, in lieu of the lump-sum death benefit, a monthly benefit payable until death or remarriage, which is equal to one-half of the retirement allowance, which the deceased member was receiving at the time of their death, provided the member had not made an

**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

optional election. If the spouse dies or remarries before the youngest unmarried child attains age 18, the pension will continue to the date that all the children have died, married, or attained age 18, whichever occurs first. If the spouse was receiving payments on or before June 30, 1978, payments shall continue after remarriage with no further payments after death.

10. Return of Contributions

Eligibility

Termination of membership prior to death.

Amount

If not eligible for a retirement allowance, all contributions with interest credited. If eligible for normal or early service, ordinary disability, accidental disability, or vested retirement allowance, their contributions, if any, is not less than the interest credited. The member may elect, prior to the commencement of their retirement allowance, to receive an annuity which is the actuarial equivalent of their accumulated contributions.

11. Normal and Optional Forms of Benefits

Normal Life

Option A

Life Annuity

A reduced pension with the provision that at death the reduced pension will be continued throughout the life of the designated beneficiary.

Option B

A reduced pension with the provision that at death, one-half of the reduced pension will be continued throughout the life of the designated beneficiary.

Option C

A reduced pension with the provision that at death some other benefit approved by the Board of Trustees will be payable.

12. Contributions

By Members

5% of pay for anyone hired on or after October 5, 2010. Effective January 8, 2015, all members (except City Council members hired before October 5, 2010) will be required to contribute 5% of pay.

By City

Annual contributions actuarially computed to be required to cover the cost of benefits of the System.

Only City contributions will continue to be made throughout the DROP period for any eligible participant who has elected to participate in DROP.

**THE EMPLOYEES' RETIREMENT SYSTEM FOR THE CITY OF NORFOLK
ACTUARIAL VALUATION AS OF JUNE 30, 2019**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

13. Deferred Retirement Option Program (DROP)

Eligibility

Any police officer or fireman member in service who attains his or her Normal Retirement Age may elect to participate.

Amount

The DROP period may be elected by the police officer or fireman member but shall not exceed four years. During the DROP period, 70% of the participant's monthly retirement allowance shall be paid to the DROP account. No interest shall accrue on this account during the DROP period. At the end of the DROP period, the participant will receive a lump sum of the DROP account and shall begin receiving his or her full monthly benefit payment as a retired member.

Only City contributions will continue to be made throughout the DROP period.

14. Changes in Plan Provisions

For participants hired on or after July 1, 2018:

- The averaging period for “average final compensation” has been increased from three to five years.
- For General Employees, normal service retirement age was changed from the earlier of age 60 or 30 years of service to the earlier of Social Security Normal Retirement Age or the age at which the combination of a participant’s age and service sums to at least 90.
- For Firefighters, Police Officers, and Paramedics, normal service retirement age was changed from the earlier of age 55 or 25 years of service to the earlier of age 60 or age 50 with 25 years of creditable service.